Audwin Fletcher, Janet R. Cooper, Pamela Helms, LaDonna Northington, and Karen Winters

Stemming the Tide of Childhood Obesity in an Underserved Urban African American Population: A Pilot Study

Abstract: *Recent data indicate that Americans are gaining weight at an alarming rate. It is estimated that over 12 million American children ages 2-19 years are overweight, with African American (AA) children comprising 20% of this cohort. The problem of obesity appears to be more prominent in some southern states. According to a new report by the Trust for America's Health, Mississippi has the 1st highest rate of adult obesity and the 8th highest rate of overweight youth ages 10-17 nationwide. The Kids for Healthy Eating and Exercising (KHEE) club was a model developed in the North Midtown area of Jackson, Mississippi. The purpose of this project was to develop the first weight control program and model specifically designed for AA children in the North Midtown area of the city of Jackson. This program devised measures to effectively enhance the lifestyle changes of selected obese children representing the target population. Results of the pilot project revealed the following changes among all participants: a decrease in body mass index (BMI); a decrease in waist girth of greater than 4 inches; and positive behavioral changes as documented in the daily entries of the participants' food journal.*

Key Words: *Obesity, Overweight, African American, Mississippi, Children, BMI*

There has been a dramatic increase in obesity in the United States over the past 20 years. In fact, obesity has become a lifelong issue—one that is a major health problem and has reached an epidemic level (National Center for Health Statistics [NCHS] 1999; U. S. Department of Health and Human Services [USDHHS], 2001; CDC, 2004; Ogden et al., 2006). According to the National Institute of Health (NIH) (2007) if left unabated, the escalating rates of obesity in the U.S. will place a severe burden on the Nation's health and its healthcare system. Similarly, the increase in prevalence has made obesity a threat to public health in this country (Menifield, Doty, & Fletcher, 2008). Obesity has been directly linked to hypertension, type 2 diabetes, heart disease, stroke, cancer, and depression (McTigue, Garrett, & Barry, 2002; Rossner, 2002; NIH, 2007). Each year, over 300,000 adults in the U.S. will die from obesity related causes. As of 2004, the proportion of obese adults in the U.S. reached 32% of the total population.

Comparatively, among adolescents, obesity has increased to 17.1% of the population between the periods of 1999-2004 (Ogden et al., 2006). Additionally, approximately 33% of all children and adolescents ages 2-19 in the U.S are overweight or at risk of overweight. This trend of increasing obesity rates in children and adolescents continues despite the national campaigns of educating adults, adolescents and children regarding the untoward effects of obesity (NCHS, 1999). Furthermore, the prevalence of overweight is higher in ethnic minority children and adolescents than white children (Davis, Arthur, Davis, Moll, & Davis, 2002; Chang & Lauderdale, 2005; Kumanyika & Grier, 2006; Ogden et al., 2006; Davis, Young, Davis, & Moll, 2008). As with adults, being overweight can create dramatic health consequences for youth such as increased risk for type 2 diabetes, hypertension and heart disease, as well as a myriad of other problems such as stress, sadness, and low self esteem (McTigue et al., 2002; Rossner, 2002; NIH, 2007).

This paper documents the findings of the pilot research study, Kids for Healthy Eating and Exercising (KHEE) club. This publication was made possible by research funds from the Mississippi Institute for the Improvement of Geographic Minority Health Disparities (MIIGM) at the University of Mississippi Medical Center which is supported by OMH Grant No.CPIMP061018-01-01.

BACKGROUND/SIGNIFICANCE

The problem of obesity appears to be more prominent in some southern states than in other states (Menifield et al., 2008). According to a new report by the Trust for America's Health (TFA) (2008), Mississippi has the 1st highest rate of adult obesity at 30.6 % and the 8th highest rate of overweight youth (ages 10-17) at 17.8% in the nation. Furthermore, the CDC (2004) contends that Mississippi leads the nation in cardiovascular disease (CVD) morbidity and mortality. While rates have declined over the past three decades in other states, Mississippi rates, particularly for African-Americans, continue to rise. African-Americans in Mississippi have CVD rates that are 50-70% higher than that of their white counterparts (Jones, Sempos, Thom, Harrington, Taylor, & Fletcher, 2000). The age adjusted heart disease and stroke death rates for African-Americans are respectively, 29% and 40% higher when compared to White Americans (Saunders, Hertz, Kim, & McDonald, 2003). Lastly, African-Americans also experience higher prevalence rates of hypertension, heart attacks, and stroke.

Additionally, the youth behavioral surveillance survey from the American Obesity Association (2003) reported 15.7% of youth in Mississippi were overweight compared to 13.4% nationally. Ironically, 28% of the youth described themselves as being either slightly or very overweight. Childhood obesity is associated with substantial medical, psychological, and social morbidity (Robinson, 2004). For example, the risk factors for heart disease occur with increased frequency in obese children and adolescents when compared to children with a healthy weight. Type 2 diabetes, previously considered an adult disease, has increased dramatically in children and adolescents. The most immediate consequence of obesity [as perceived by children, themselves] is social discrimination. Finally, overweight children and adolescents have a 70% chance of becoming obese adults. This increases to 80% if one or more parent is overweight or obese (American Obesity Association, 2003). The prevalence of obesity in the young varies by ethnicity and race. It is estimated that 5% to 7% of Caucasian and African-American children are obese while 12 % of Hispanic boys and 19 % Hispanic girls are obese (Keku, Kenney, Dawson, Gerard, & Hill, 2000; Davis, Davis, Northington, Moll, & Kolar, 2002; Speed, Meyer, Kolbo, Legget, & Penman, 2003). As indicated earlier, studies showed an alarming rise in obesity among children in the U.S. during the last twenty years. The prevalence of obesity increases with age among both males and females, and it is more likely that obese adolescents will become obese adults. Obesity presents numerous problems for the child. It takes a toll on physical health and psychosocial adjustment. Childhood obesity is the leading cause of pediatric hypertension and has been linked to risk factors for coronary heart disease. These staggering obesity figures, coupled with the morbidity factors associated with obesity dictate creative solutions.

Obesity can become a lifelong issue. Realizing that obesity is easier to prevent than to treat, this program's aim was to teach youth that obesity is not a normal phase of development, but rather, a result of an improper balance between food intake and exercise. Furthermore, proper nutrition does not need to be boring or difficult, and good exercise/activity does not have to be dull or isolating. Studies have indicated the reason most obese adolescents regain their lost pounds is that after they have reached the desired goal, improper eating patterns and the lack of a constant exercise regimen become less of a priority in an already full adolescent's schedule (Menifield et al, 2008). Hence, adolescents must learn to eat and enjoy healthy foods in moderate amounts and to exercise regularly to maintain the desired weight. Parents of an obese child can improve the self-esteem of the child by emphasizing their strengths and positive qualities. In addition, the program made nutrition and exercise a family affair by planning lower fat meals, nutritious snacks and providing for fun-family activities.

The elimination of disparities in health is one of the overarching goals of Healthy People 2010, and ensuring access to quality health services is one of the focus areas (USDHHS, 2001). Research is needed which focuses on the excessive burden of CVD in African-Americans as well as the impact of CVD risk factors such as obesity, sedentary lifestyles, poor nutritional habits. Research that addresses these disparities has consisted primarily of epidemiological research which compares rates of disease and risk factors in African-Americans to those of white Americans (Mayberry, Mili, & Ofli, 2000). Innovative approaches that extend beyond these comparisons to include interventions that effectively eliminate disparities in health and health care are needed. Neumark-Sztainer, Falkner, Story, Perry, Hannan, & Mulert, (2002) contended that nearly 80% of our children are overweight and physically not fit, yet just 20% of our nation's schools have mandated daily fitness classes. Despite the documented need, there are few weight control programs designed specifically for children and none specifically designed for African American children. Hence, the purpose of this pilot project was to develop the first weight control program and model specifically designed for African American children.

DEFINING OBESITY AND OVERWEIGHT

The USDHHS (2001) and the CDC (2004) describe obesity and overweight as labels for ranges of weight that are greater than what is generally considered healthy for a given height. They also argue that the terms identify ranges of weight that have been shown to increase the likelihood of certain diseases and other health problems. *Overweight* refers to increased body weight in relation to height, when compared to some standard of acceptable or desirable weight. **Overweight may or may not be due to increases in body fat or** due to an increase in lean muscle. For example, professional athletes may be very lean and muscular, with very little body fat, yet may weigh more than others of the same height. While they [the athletes] may qualify as "overweight" due to their large muscle mass, they are not necessarily "over fat," regardless of BMI.

Obesity is defined as an excessively high amount of body fat or adipose tissue in relation to lean body mass or as BMI for age $\geq 95^{th}$ percentile. The amount of body fat (or adiposity) includes concern for both the distribution of fat throughout the body and the size of the adipose tissue deposits. Body fat distribution can be estimated by skin fold measures, waist-to-hip circumference ratios, or techniques such as ultrasound, computed tomography, or magnetic resonance imaging.

PROJECT DESIGN AND METHODOLOGY

Data were collected via a descriptive, developmental study. Pre- and post-tests, BMI assessment, surveys, participant and faculty satisfaction questionnaires, and anthropometrics [weight loss total, BMI, waist girth, and total inches lost] were used to collect data. The statistical analyses were paired t-test and anthropometrics/weight loss records.

The project involved reducing childhood obesity to improve overall health in African-American children by teaching the proper balance between food intake and exercise. The KHEE Club consisted of a ten-month daily or weekly pilot program. The program convened during the regular school semesters [**Fall,** August through December; **Spring,** January through May] from 3:00 pm – 5:00 pm. All children selected for the program were eligible for Mississippi Children Health Insurance Program (CHIP) or Medicaid and were identified upon regularly scheduled Medicaid screenings at the UNACARE Health Center. Parental consent was obtained at the time of screenings. The conceptual model was based on a three-level approach to preventing and/or treating childhood obesity. **Level I** consisted of baseline BMI screening of all children in the 39212 zip code between the ages of 13-19. **Level II** consisted of initiating early interventions for children with BMI measurements of greater than 25 but less than 30. Early interventions consisted of creating services and supports that addressed risk factors of obesity. **Level III** consisted of coordinated, comprehensive, intensive, and sustained child- and family-focused services and supports (Appendix A). Each participant was individually assessed for nutrition and physical activity intervention. Each person was given a plan based on individual needs and stage of change. Caloric intakes were determined and meal plans developed. The group participated in group and individual interventions. The group was assessed on pre- and post-knowledge in several key nutritional areas. Topics completed during the project included: Basic Meal Plan and Meal Planning, Know Your Label, Portion Distortion, Healthy Snacking and Carbohydrate Counting, and Healthy Eating during the Holidays. Activity included sixty minutes of cardiovascular activities and thirty minutes toning exercises

Table 1: Program Phases and Activities

Phase		Activities
Intervention	**Level I - Screening** All children	• Recruitment during the months of June and July, preceding the fall semester • Screening physicals for all potential participants including preliminary lab work (CBC, Urinalysis, and EKG), and a calculated baseline BMI. • Selection of the participants based on the criteria
	Level II - Early Intervention Children with BMI >25 and <30	• KHEE Club program meetings one day per week • Exercise program implemented • Nutritional classes implemented • Chaperoned field trips for participants and parents
	Level III - Intensive Intervention Children with BMI >30	• KHEE Club program activities daily • Exercise program implemented • Nutritional classes implemented • Chaperoned field trips for participants and parents
Graduation		• End of Spring Semester • Demonstration of knowledge gained through role play exercises • Parental participation from knowledge gained • Measurements of changed cumulative BMI
Summer Retreat		• Active recruitment of 2nd year participants • All graduated participants would now serve as ambassadors for the KHEE Club

using weight resistance in group settings twice a week. The program consisted of five phases (Table 1).

During the KHEE club sessions, mutually developed individual goals based on the BMI were set for each child. Structured nutritional sessions for participants included instructions on the basic food groups, fad diets, choosing healthy foods, and preparing healthy foods. Chaperoned field trips were designed to give "hands-on" experience with shopping for nutritional foods, dining at local restaurants, and choosing healthy foods from menus.

Study Population

The target population for the project was a microcosm of the minority population of Mississippi. It was characterized by a high rate of unemployment, low literacy, little or no health insurance and high rates of heart disease, asthma, diabetes, and stroke. Access [lack thereof] to affordable quality health care is thought to be a causative factor contributing to poor health status. The federal government has designated North Midtown, where UNACARE is located, as a medically underserved area. Demographics of the area as follows:

- Total population, 8,830
- Youth between ages of ten and nineteen, 1,188
- White, 44%
- Black, 52%
- Median Household income, $24, 935
- Average Family size, 3.16
- Families living below poverty level, 404
- Individuals living below poverty level, 2,578

Program Eligibility criteria consisted of the following:

- 39212 Jackson, Mississippi zip code address
- 13-19 years of age
- BMI >25
- Willingness to participate
- Informed parental consent to participate

Twelve students participated in the study (Table 2). The ages of the participated ranged from 13-17. Ninety-two percent of the participants were female and in high school (9th grade or higher). All participants had BMI >25.

RESULTS

The following results were included at the conclusion for the KHEE club. **BMI**—all participants [n=12] showed decrease in BMI. Although, all participants showed greater than 10%

Table 2: Profile of Study Participants, N=12

Variable	N	%
Age		
13	1	.08
14	2	.17
15	6	.50
16	2	.17
17	1	.08
BMI		
25-29	6	.50
30-34	4	.34
35-39	1	.08
>40	1	.08
Gender		
Female	11	.92
Male	1	.08
Grade Level		
8th	1	.08
9th	9	.76
10th	1	.08
11th	1	.08

weight loss, one student showed status change from obese to overweight. NOTE: BMI does not note difference between muscle mass and fat. **Waist Girth**—all participates [n=12] had deceased waist girth of greater than four (4) inches. **Behavioral changes**—the participants [n=12] found the use of the food journals beneficial. Fifty percent reported daily documentation of intake, while 33.3% and 16.7% stated use of journal as "sometime" and "only for review", respectively. Eighty percent of sample increased their intakes of fruits and vegetable to the recommended intake of 5 servings per day (with at least two servings of vegetables per day). All [n-12] participants consumed at least 3 servings of calcium-rich foods. All [n=12] participants stated the use of broiled, grilled or baked cooking method when purchasing or preparing foods. All [n=12] participants stated reading labels and the use of label reading in the decision making process. All [n=12] participants had either deleted carbonated beverages or changed to a diet variety. The triceps skin folds showed a significant decrease ($p \leq .05$) for all participants. All [n=12] participants stated feeling a difference in physical endurance. All [n=12] participants stated having changed to a 3-4 days per week activity schedule, with two of the participants [16.6%], including a 5 days per week activity schedule. All [n=12] participants preferred muscle toning over cardiovascular. Twenty-five percent of the participants stated the intent of limiting cardiovascular to 3 days/ week; while, 75% of the participants stated the intent of continuing cardiovascular activities at >3 days per week. All [n=12] participants voiced the hope of continuing with a trainer to reach final weight goals. When asked "what was your favorite aspect to the program", 83.3% said, "Ms. Johnson's tough love approach in helping them to achieve their goals" while the other 16.7% stated learning nutrition and the role of eating more properly had in fighting disease. When asked how they felt about the program—83.3% said they loved it and wish it could continue; and, 16.7% said they liked the program but didn't like the time. When asked their commitment to continue with changes in lifestyle—100% said yes. However, 50% said they didn't know where they would workout. And, 25% said they knew where they could go but did not know how they would get there.

DISCUSSION

It is evident that the KHEE Club has successfully changed the lifestyles of its participants. With the increased incidence of hypertension and type II diabetes in teens, it is rewarding to see the efforts these students have made. Each KHEE club member has been encouraged to share the behaviors with friends and family members. It is believed that with the changes in the teens' lifestyles that positive changes will also be found in the remaining members of the household. The findings from this pilot project are important for two reasons. One, the project allows us to critically analyze the results of our efforts to improve the health of the participants with emphasis on weight control and reduction. Secondly, the analytic results allow us to disseminate the information gleaned to the larger academic audience. Ultimately, we hope to make significant contributions in the reduction of adverse health outcomes in African American children. For this project, the participants have:

- gained knowledge, skills and confidence to make healthy lifestyle choices
- improved their level of physical fitness
- gained an understanding of the impact [short- and long-term] of the benefit of physical activity
- gained the understanding of the connection between mental health and physical health
- learned that fitness can be fun while being healthy, and
- learned lifelong healthy behaviors that could reduce the risk for weight related diseases through healthy lifestyle choices and increased physical activity.

REFERENCES

American Obesity Association. (2003). *Health Effects of Obesity.* American Obesity Association Fact Sheets. Retrieved from April 30, 2008, http://www.obestiy.orgr/subs/fastfacts/Heatlh_Effects.shtml.

Centers for Disease Control and Prevention. (2004). Surveillance summaries, June 28, 2002. *MMWR*, 51, (No.22-4).

Chang, V. W., & Lauderdale, D. S. (2005). Income disparities in body mass index and obesity in the United States, 1971-2002. *Archives of Internal Medicine,* 165 (18), 2122-2128.

Davis, M., Young, L., Davis, S. P., & Moll, G. (2008). Parental depression, family functioning and obesity among African American children. *Journal of Cultural Diversity,* 16 (2), 61-65.

Davis, S., Arthur, C., Davis, M., Moll, G., & Davis, G. (2002). Assessing cardiovascular risk in children: The Jackson, Mississippi CRRIC study. *Journal of Cultural Diversity,* 9 (3), 19-26.

Davis, S. P., Davis, M., Northington, L., Moll, G., & Kolar, K. (2002). Childhood obesity reduction by school based programs. *Association of Black Nursing Faculty Journal,* 13, (6), 145-49.

Jones, D. W., Sempos, C. T., Thom, T. J., Harrington, A. M., Taylor, H. A., & Fletcher, B. W. (2000). Rising levels of cardiovascular mortality in Mississippi, 1979- 1995. *American Journal of Medical Sciences, 319 (3), 131-137.*

Keku, E., Kenney, A., Dawson, E., Gerard, P., & Hill, E. (2000). The prevalence and correlates of overweight in overweight school children in Tupelo, Mississippi. North Mississippi Medical Center, Tupelo, MS. Unpublished.

Kumanyika, S., & Grier, S. (2006). Targeting interventions for ethnic minority and low-income populations. *Future of Children,* 16 (1), 1017—1022.

Mayberry, R. M., Mili, F., & Ofili, E. (2000). Racial and ethnic differences in access to medical are. *Medical Care Research and Review,* 57 (Suppl 1), 108-145.

McTigue, K. M., Garrett, J. M., & Barry, M. P. (2002). The natural history of the development of obesity in a cohort of young U.S. adults between 1981-1998. *Annals of Internal Medicine*, 136, 857-864.

Menifield, C. E., Doty, N., & Fletcher, A. B. (2008). Obesity in America. *The Association of Black Nursing Faculty Journal,* 19, (3), 83-88.

National Center for Health Statistics (1999). *Healthy People 2000 Review, 1998-1999.* Hyattsville, MD: Public Health Service.

National Institute of Health (2007). African Americans and overweight youth. *NIH Publication* No. 04-4955.

Neuwmark-Sztainer, D., Falkner, N. Story, M., Perry, C., Hannan, P. J., & Mulert, S. (2002). Weight-teasing among adolescents: Correlations with weight status and disordered eating behaviors. *International Journal of Obesity, 26, 123-131.*

Ogden, C. L., Carroll, M. D., Curtin, L. R., McDowell, M. A., Tabak, C. J., & Flegal, K. M. (2006). Prevalence of overweight and obesity in the United States, 1999-2004. *Journal of the American Medical Association,* 295, 1549-1555.

Saunders, E., Hertz, R. P., Kim, K., & McDonald, M. (2003). Racial differences in cardiovascular health: Findings from the National Health and Nutrition Examination Surveys (NHANES) III and 1999-2000: National Medical Association and Pfizer Global Pharmaceuticals.

Speed, N., Meyer, M. K., Kolbo, J., Leggett, D., & Penman, A. (2003). *Child and adolescent prevalence of overweight survey in grades 1-8: A preliminary report.* Paper presented at meeting of the Mississippi Alliance for School Health, Biloxi, MS.

Robinson, T. N. (2004). Reducing children's television viewing to prevent obesity: A randomized controlled trial. *Journal American Medical Association, 282 (16), 1561-67.*

Rossner, S. (2002). Obesity: The disease of the twenty-first century. *International Journal of Obesity,* 26 (40), S2-S4.

Trust for America's Health (2008). Obesity Report in Mississippi 2007. Retrieved July 20, 2008 from http://healthyamericans.org/reports/obesity2007

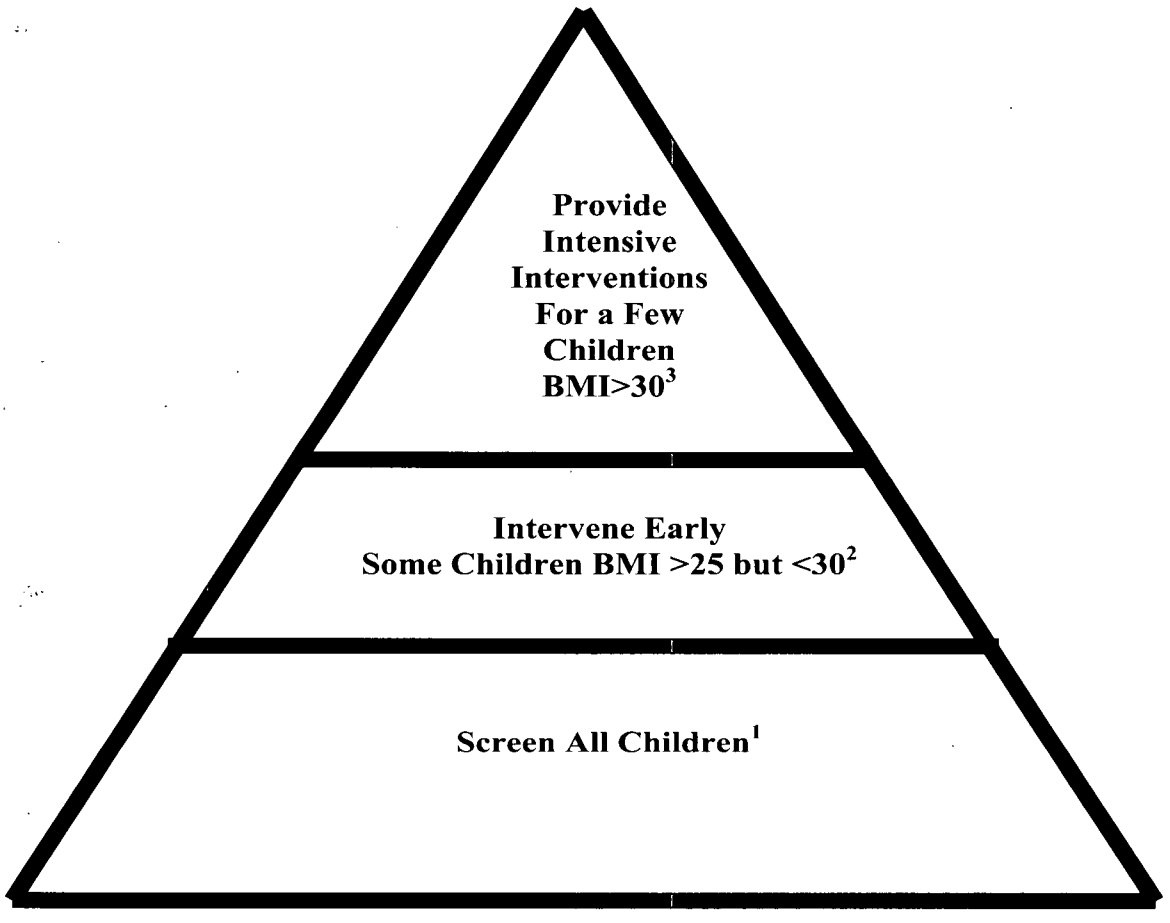
U.S. Department of Health and Human Services. (2001). *The surgeon general's call to action to prevent and decrease overweight and obesity.* Rockville, MD: United States Department of Health and Human Services, Office of the Surgeon General.

U.S. Department of Health and Human Services. (2001). *Healthy People 2010: Understanding and improving health.* 2nd ed. Retrieved March 05, 2007, from http://www.healthypeople.gov/publications.

Audwin Fletcher, *is a Professor of Nursing in the School of Nursing at the University of Mississippi Medical Center, located in Jackson, MS. Dr. Fletcher may be reached at:* afletcher@son.umsmed.edu. **Janet R. Cooper**, *Assistant Professor of Nursing*, **Pamela Helms**, *Assistant Professor of Nursing*, **LaDonna Northington**, *Associate Professor of Nursing, and* **Karen Winters,** *Assistant Professor of Nursing, all teach at the School of Nursing, University of Mississippi Medical Center located in Jackson, MS.*

Appendix A

A Three-Level Approach to Childhood Obesity



Screen all children[1]
Screen all children in 39212 zip area between the ages of 13-19

Intervene Early[2]
Create services and supports that address risk factors of obesity for children with BMI>25 but <30

Intensive Interventions[3]
Provide coordinated, comprehensive, intensive, sustained, child-and-family focused services and support for children with BMI >30