

Title of Project: Prevalence of childhood overweight and obesity in OU Children's Physicians Primary Care Clinics

Principal Investigator: Ashley Weedn, M.D., Department of Pediatrics

Co-Principal Investigator: Paul Darden, M.D., Department of Pediatrics

Stephen Gillaspay, Ph.D., Department of Pediatrics

Co-Investigators: Ken Copeland, M.D., Department of Pediatrics

Casey Hester, M.D., Department of Pediatrics

Briana Bright, M.D., Department of Epidemiology and Biostatistics

Abstract:

The purpose of this project is to assess the prevalence of childhood overweight and obesity in the OU Children's Physicians primary care clinic population and to explore potential racial/ethnic disparities in obesity within this population. Prevalence of overweight and obesity will be determined by assessment of each patient's body mass index percentile determined by the patient's age, gender, height, and weight via electronic medical record chart review of patients ages 2-18 seen in the General, Community, Latino, and Adolescent clinics. Bivariate and multivariate analyses will be performed to explore racial/ethnic differences in overweight and obesity in our clinic population and to compare our patient population to national prevalence estimates for childhood obesity in Oklahoma.

A. Specific Aims:

The goal of this study is to determine prevalence rates of overweight and obesity in children seen at the OU Children's Physicians primary care clinics. We hypothesize that prevalence rates of overweight and obesity in this population will be higher than the national estimates using self-reported survey data. Our specific aims include:

Specific Aim 1: Determine prevalence of childhood overweight and obesity in OUCP primary care clinics by age and gender.

Specific Aim 2: Determine racial/ethnic disparities in childhood obesity in OUCP primary care clinics.

Specific Aim 3: Compare the prevalence rates of overweight and obesity in OUCP primary care clinics to the reported prevalence rates using the 2007 National Survey of Children's Health, and identify discrepancies.

The long-term objective is to provide a baseline of measured prevalence rates for childhood overweight and obesity in our clinic population and to assess disparities in obesity to guide intervention programs and inform policy.

B. Background and significance:

The prevalence of childhood obesity has tripled over the past 30 years with 32% of children and adolescents aged 2-19 now classified as overweight or obese by their body mass index (BMI)^{1,2}. In Oklahoma, minimal data exist on prevalence of childhood obesity; however, surveys suggest Oklahoma children and teenagers are equally affected by obesity as their national peers. The

Youth Risk Behavior Survey reported 30% of Oklahoma high school students were obese or overweight in 2007³. Similarly, the 2007 National Survey of Children's Health reported overweight and obesity in 29.5% of children ages 10-17 in Oklahoma⁴. Both surveys were based on parental report of height and weight as no state-wide database or surveys with measured BMI in children currently exists.

Nationally, racial/ethnic disparities in obese children and adolescents have been well documented^{5,6,7,8}. NHANES data from 1999-2008 demonstrate a higher prevalence of obesity among Hispanic (21%) and non-Hispanic black youth (21%) compared to non-Hispanic Whites (15%); however, NHANES lacks information on American Indian children^{1,2}. Population-based studies indicate that American Indian children have the highest rates of childhood obesity in the United States, with estimates ranging from 21%-39%⁶. Additionally, national surveys have shown that American Indian preschool children have prevalence rates nearly twice as high as non-Hispanic white preschool children (21-31 % v.s. 12-16%)^{9,10}.

These racial/ethnic disparities raise significant concern for Oklahoma, which has the second highest population of American Indians in the United States comprising 11% of the state's population¹¹. Only one study has been published regarding racial/ethnic disparities in obesity in Oklahoma. Eichner et al. reported that nearly 50% of children ages 6-17 in a rural, ethnically diverse Oklahoma school district were either overweight or obese¹². American Indians had the highest combined prevalence rates of overweight and obesity (54%) followed by African Americans (52%), Hispanics (51%) and white children had the lowest prevalence of overweight and obesity at 38%¹². All reported rates were much higher than the documented state and national prevalence rates. Further exploration of the prevalence in overweight and obesity in Oklahoma, especially in American Indians, are needed.

C. Preliminary Studies/Progress Reports:

Principal Investigator, Ashley Weedn, is a board-certified pediatrician and faculty member in the Department of Pediatrics, Section of General and Community Pediatrics. Previous research experience includes 3 years as a research assistant in the Section of Genetics as the Coordinator of the Familial Pancreatic Cancer Study, led by Dr. John Mulvihill, which resulted in local, national, and international presentations. During residency, she was the lead investigator for a national study on prenatal diagnosis of birth defects, also resulting in local and national presentations. Her most recent research has focused on obesity with collaboration at the University of California San Francisco Children's Hospital to determine the prevalence and trends of obesity in California children, which was presented at a national meeting and pending publication.^{13,14} Paul Darden, co-principal investigator and advisor, has a long history of training junior faculty in research methodology and has also published in the obesity arena.^{15,16}

D. Research Design and Methods:

Data will be obtained from the Community Pediatrics, General Pediatrics, Latino, and Adolescent clinics at OU Children's Physicians by systematic chart review utilizing EMR for patients seen in these clinics from 2008 to present. Requested data include date of birth & date of visit (to calculate age in months), gender, race/ethnicity, insurance provider, height, weight,

body mass index (BMI), and ICD-9 codes. The date of birth and date of visit will only be used for calculation of the child's age in months in order to calculate his/her BMI, then these data fields will be deleted from the database. We do request to retain the month and year of date of visit for analysis of trends in high BMI.

Height and weight are measured by clinic staff. BMI is calculated from measured height and weight, then will be converted to BMI percentiles using the CDC program based on 2000 sex-specific BMI-for-age growth charts with three established BMI % cut points for overweight and obesity: > 85th percentile (overweight), > 95th percentile (obese), and > 97th percentile. As mentioned above, in order to perform these calculations, the patient's date of birth and date of visit are requested for calculation purposes only. Clinic data will be compared to national data using the 2007 National Survey of Children's Health.

E. Statistical Methods:

Descriptive analyses of overweight and obesity in the different clinic populations will be performed, stratified by age, gender, and race/ethnicity. Differences in prevalence of overweight and obesity by race/ethnicity and age will be assessed using logistic regression. Prevalence of overweight and obesity in our clinic populations will be compared to the prevalence of overweight and obese children in the 2007 National Survey of Children's Health by comparing 95% confidence intervals.

F. Gender/Minority/Pediatric Inclusion for Research:

De-identified data on male and female children and adolescents ages 2-18 from all racial and socioeconomic backgrounds will be included in our study.

G. Human Participants: N/A

H. Data and Safety Monitoring Plan: N/A

I. Literature Cited:

1. Ogden CL, Carroll MD, Curtin LR, et al. Prevalence of high body mass index in US children and adolescents, 2007-2008. *JAMA*. 2010;303:242-249.
2. Ogden CL, Carroll MD, Flegal KM. High body mass index for age among US children and adolescents, 2003-2006. *JAMA*. 2008;299:2401-2405.
3. National Center for Chronic Disease Prevention and Health Promotion. Youth Risk Behavior Survey 2007- Oklahoma. Retrieved on February 10, 2010 from www.cdc.gov/HealthyYouth/states/ok.htm.
4. Childhood Obesity Action Network. State Obesity Profiles, 2009. National Initiative for Children's Healthcare Quality, Child Policy Research Center, and Child and Adolescent Health Measurement Initiative. Retrieved on February 10, 2010 from www.childhealthdata.org.
5. Singh GK, Siahpush M, Kogan MD. Rising social inequalities in US childhood obesity, 2003-2007. *Ann Epidemiol*. 2010;20:40-52.

6. Crawford PB, Story M, Wang MC, Ritchie LD, Sabry ZI. Ethnic issues in the epidemiology of childhood obesity. *Pediatr Clin North Am.* 2001;48):855-878.
7. Skelton JA, Cook SR, Auinger P, Klein JD, Barlow SE. Prevalence and trends of severe obesity among US children and adolescents. *Acad Pediatr.* 2009;9:322-329.
8. Freedman DS, Khan LK, Serdula MK, Ogden CL, Dietz WH. Racial and ethnic differences in secular trends for childhood BMI, weight, and height. *Obesity.* 2006;14:301-308.
9. Anderson SE, Whitaker RC. Prevalence of obesity among US preschool children in different racial and ethnic groups. *Arch Pediatr Adolesc Med.* 2009;163:344-348.
10. Centers for Disease Control. Obesity prevalence among low-income, preschool-aged children – United States, 1998-2008. *MMWR.* 2009;58:769-773.
11. The American Indian and Alaska Native Population: 2000. US Census Bureau, 2000. Retrieved on March 23, 2010 from www.census.gov.
12. Eichner JE, Moore WE, Perveen G, Kobza CE, Abbott KE, Stephens AL. Overweight and obesity in an ethnically diverse rural school district: the Healthy Kids Project. *Obesity.* 2008;16:501-504.
13. Weedn AE, Madsen KA, Crawford PA. Trends in the prevalence of high BMI among youth in California. Presented at the National Pediatric Academic Societies Meeting, Vancouver, Canada, May 2010.
14. Madsen KA, Weedn AE, Crawford PA. Disparities in peaks, plateaus, and declines in prevalence of high BMI among adolescents. *Pediatrics.* In press.
15. Basco WT, Hletko PJ, West L, Darden PM and the South Carolina Pediatric Practice Research Network. Determining the proportion of too heavy for age appropriate car seats in a practice-based research network. *Clinical Pediatrics.* 2009;48:37-43.
16. Roberts JR, Kennedy SA, Darden PM, Basco WT. Prevalence of overweight in children: comparing children from the South Carolina Pediatric Practice Research Network to a national sample. *Clinical Pediatrics.* In press.