

## Associated Colleges of the Midwest (ACM)

### Costa Rica: Field Research in the Environment, Social Sciences, & Humanities

#### Research Paper Abstracts for Jessica Meyer, Chloe Souza, and Margot Swift

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**Meyer, Jessica, “Media Screen Time, Physical Activity Time, and Anthropometric Measures as Indicators of Overweight and Obesity in Adolescents and Children in Venecia, Alajuela, San Carlos Region, Costa Rica (Feb – April 2011).” Advisors: Drs. Freddy and Diana Ulate. Colorado College. 2011. 39pp.**

Child obesity and overweight are a growing worldwide health concern. The causes and risk factors associated with overweight and obesity have become a growing area of research in order to better understand this epidemic. A more comprehensive understanding of obesity and overweight risk factors can help with preventative measures concerning health, costs and future complications. This study included 988 rural school children, in Preschool to 11<sup>th</sup> grade, in Venecia, San Carlos, Costa Rica. Anthropometric and informational data about obesity and overweight risk factors were collected from all students to observe the prevalence of obesity and determine if relationships were present between the prevalence and risk factors. I personally visited schools to distribute a self-reporting survey about associated risk factors to students. Schools were then returned to at least once, to take anthropometric data and collect the completed survey from the students. Obesity and overweight were calculated using both Body Mass Index (BMI) and abdominal circumference classifications. I then calculated the relationship between the frequencies of weight classifications and measured risk factors. The total prevalence of obesity, according to BMI classifications, was 16.07% and 9.1% according to abdominal circumference classifications. Both of these classifications of obesity were significantly related to the proposed risk factors of computer and video game screen time, and negatively related to the proposed risk factor of physical activity. Given these high rates of obesity in children it is clear that Costa Rica is no exception to the worldwide obesity and overweight epidemic. Specifically, abdominal circumference was negatively related to physical activity during the week and on the weekend ( $p < .001$ ). Furthermore, it was positively related to computer viewing time during the week and the weekend ( $p < .001$ ). In addition, BMI was positively related to computer viewing time during the week and the weekend ( $p < .001$ ). In addition, future research should include more generalized populations so conclusions can be further generalized. The observed strength of the associated risk factors can be used as the basis for future research of risk factors and targets for home and school based intervention programs.

**Souza, Chloe , “Media Screen Time, Physical Activity and Nutritional Indicators as Risk Factors for Childhood and Adolescent Overweight and Obesity in Aguas Zarcas, Costa Rica.” Advisors: Drs. Freddy and Diana Ulate. Macalester College. 2011. 40pp.**

Childhood obesity is becoming an increasingly prominent and dangerous issue worldwide. Although much is known about the related health problems, psychosocial issues, and medical costs of obesity, little has been discovered about the etiology and specific risk factors

associated with the epidemic, especially in developing countries. I therefore conducted a study aiming to better understand the prevalence and related risk factors of obesity in rural Aguas Zarcas, Costa Rica in the Spring of 2011. I worked with 1,025 school-aged children ages 4 to 18 years old by distributing surveys about hypothesized risk factors (birth weight, amount of time spent in front of the television, computer, or video games, and usual time spent on physical activity) and measuring each subject's height, weight, and abdominal circumference. I then used this information to understand the relationship between the proposed risk factors and current obesity rate. I found that there was a positive relationship between screen time (time spent in front of a television, computer, or video game) and BMI/abdominal circumference, as well as a negative relationship between physical activity and BMI/abdominal circumference. For example, time spent watching television on the weekend was significantly related to BMI ( $p < .001$ ) and physical activity throughout the week and weekend was significantly negatively correlated with both BMI and abdominal circumference ( $p < 0.0001$ ). I further discovered that the majority of children involved in the study fell within healthy height and weight classifications, although 12% were considered obese according to BMI standards. I found a dependency between weight classifications (underweight, healthy, overweight, obese) and age groups for boys ( $p < 0.01$ ) and girls ( $p < 0.05$ ), meaning that certain age groups have higher rates of BMI than others. Obesity rates were especially high among both males and females ages 10 through 12. Although many of these findings cannot be widely generalized and compared to past studies due to differences in methodology, they can be used to inform the ministry of education and health in Costa Rica to implement intervention programs to further prevent the rise of childhood obesity.

**Swift, Margot, "Media Screen Time, Physical Activity, and Birth Weight: The Status of Nutritional Indicators among Children and Adolescents in Pital, San Carlos, Alajuela, Costa Rica." Advisors: Drs. Freddy and Diana Ulate. Macalester College. 2011. 34 pp.**

Childhood obesity and overweight is a growing epidemic worldwide. More detailed understanding of the risk factors for overweight and obesity and their prevalence can aid in the fight against them and their associated risks, costs, and complications. This study collected anthropometric data and quantitative information about proposed risk factors for obesity and overweight from 667 rural school children in Pital, San Carlos, Costa Rica and determined their prevalence and the effectiveness of the risk factors as identifiers. Schools were generally visited twice; the first to distribute surveys and the second to collect them and take anthropometric measurements. I measured frequencies of overweight and obesity and estimated the relationships between them and proposed risk factors. Most participants were within the normal range for nutritional status (i.e. not underweight, overweight, or obese) based on BMI and abdominal circumference, as well as the normal range for height. Both BMI and abdominal circumference were significantly related to almost all proposed risk factors. TV screen time Monday-Friday was strongly positively related to both BMI and abdominal circumference ( $p=0.0001$ ;  $p=0.0001$ ). A strong relationship was found between physical activity every day of the week and both BMI and abdominal circumference (all  $p=0.0001$ ). Although a weaker relationship, birth weight proved to be positively associated with BMI and abdominal circumference ( $p=0.0074$ ;  $p=0.0184$ , respectively). Overall, an intervention that focuses on decreasing screen time, increasing physical activity, and monitoring children born with high birth weights has the potential to improve the nutritional status of children and adolescents in Pital, Costa Rica.