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Physical Activity for Rural, Low-Income Children

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Introduction

According to the Centers for Disease Control and Prevention (CDC), regular physical activity helps improve one's overall health and fitness, and reduces the risk for many chronic diseases (CDC, 2011). The recommended amount for children and adolescents is sixty minutes or more each day of moderate to vigorous physical activity. This should include aerobic activity, muscle strengthening, and bone strengthening. Also, the consumption of five to nine fruits and vegetables per day is recommended (Fruits and Vegetables More Matters, 2013).

People in rural areas are more likely to be obese than people living in non-rural areas (Lutfiyya, Garcia, Dankwa, Young, & Lipsky, 2008; Morgan, 2002; Shores, Moore, & Yin, 2010). Rural areas have less access to quality healthcare and physicians, thus being deemed medically underserved (Eberhardt & Pamuk, 2004). Since over two-thirds of the population in Kentucky is overweight or obese (CDC, 2011), the prevention of obesity-related, chronic diseases is key in rural areas. The lifestyle diseases associated with overweight and obesity include high blood pressure, type II diabetes, cancer, and heart disease (Kelishadi, Razaghi, & Gouya, 2006; Ogden, Carroll, & Flegal, 2008).

Developing healthy habits at a young age, as well as providing children with the knowledge, attitude, skills, and opportunities to be physically active, are crucial when promoting health and preventing disease ("Education", 2004). Children should not only be educated on the quantity and quality of physical activity but be given equal opportunities to participate in physical activity programs, regardless of their income or access to consistent transportation. *Healthy People 2020*, the nation's health agenda, recognizes that rural residency is a leading health indicator linked to health inequity, and suggests that communities create social and physical environments to improve public health (Healthy People 2020, 2013).

Kentucky consistently scores low on national health scores. For example, on the national physical activity behavioral indicators list, Kentucky is among the states that scores the lowest. The case begins with sedentary lifestyles, with over 30% participating in zero physical activity (CDC, 2013). Only 41.4% of adults are physically active and 21.4% of children are physically active in Kentucky (CDC., 2013). Additionally, body mass index (BMI) determines if a person is overweight (BMI 25.0-29.9) or obese (BMI 30.0 or higher). In Kentucky, 31.3% of the adults are obese and 15.5% of children and adolescents are obese (Trust for America's Health and Robert Wood Johnson Foundation, 2013). Finally, 49.7% of adolescents reported consuming fruits less

than one time daily and 43.2% of adolescents reported consuming vegetables less than one time daily (CDC, 2013).

It is recommended that communities recognize and address their health needs (Healthy People 2020, 2013). In the fall of 2008, parents and community leaders of Meade County assembled to discuss the lack of a public swimming pool for their children. From that meeting, the residents determined that a broad range of community needs existed. They realized that access to recreational facilities and health-related programming was not available in Meade County. The community members also recognized that health is significantly influenced by lifestyle-related behaviors often adopted during childhood, so they needed to address the lack of access to physical activity programming and places for youth. Recreational facilities are non-existent in Meade County and the opportunity to be physically active in schools, through physical education and sports teams, are minimal. Since Meade County is a rural county in Kentucky with a population of 29,237 residents, a change needed to be made (U. S. Census Bureau, 2011).

Addressing the lack of physical activity facilities and resources in the community became the primary goal for community members, thus forming the Meade Activity Center, Inc. They realized that addressing their communities' health disparities, "health differences linked with social, economic, and/or environmental disadvantages", may be key in improving public health (Healthy People 2020, 2013). A main community disadvantage is the socioeconomic status of Meade County. Of the students attending public schools, 49% are eligible for free or reduced-priced meals, indicating low socioeconomic status (Kentucky Youth Advocates, 2011). To date through the MAC, there are over 40 youth sports and physical activities, community events, and summer camps, reaching over 800 children annually. Several physical activity programs occur simultaneously on Saturdays for eight-week sessions, five rounds per year.

Although there are several purposes within the entire Meade Activity Center (MAC) study, the primary research questions for this portion of the study are:

1. What are the demographic, health behavior, and health access characteristics of children in Meade County?
2. Do differences in physical activity participation exist among children with different socioeconomic backgrounds?
3. Do children with different socioeconomic backgrounds perceive they are physically active due to Meade Activity Center programs differently?

Methods

Data Collection

This study employed a cross-sectional survey research design. In May 2013, the MAC Executive Director mailed an invitation letter, the Children's Health Survey (CHS), two parental/guardian informed consent forms, two child assent forms, and a pre-stamped, MAC-addressed envelope to all children's home addresses ($N = 766$, ages 5-18 years) who were previously or currently enrolled in any MAC programming. Parents/guardians were invited to sign the parental/guardian informed consent form, ask their child to sign the child assent form, ask their child to complete the CHS, and mail the three items to the MAC. Of the 50 packets returned, 42 were complete and eight were incomplete due to missing either a parental/guardian consent and/or child assent (5.5% response rate).

Instrumentation

The CHS included eight demographic items, two access to physical activity opportunities items, ten nutrition behavior items, 17 physical activity self-efficacy items, 14 physical activity behavior items, and four television and computer gaming "screen time" items. Items were modified from the Youth Risk Behavior Surveillance Survey and Children's Physical Activity Correlates Survey. Socioeconomic status (SES) was measured by "Do you receive free or reduced-price lunch when you're at school?" While this may not have captured all low SES children (i.e. those not enrolling in the lunch program), it did ensure that those selecting yes were not in the high SES category. Number of physical activity opportunities was measured by "Place a checkmark beside ALL physical activities or sports that you participated in this past summer and this current school year (include any activities run by your school or other community groups)." Access to physical activity opportunities was measured by answering yes or no to the item "Are you physically active because you participated in Meade Activity Center Programs?"

Data Analysis

Descriptive statistics were employed to illustrate the demographic, access, and health behavior items. An independent sample t-test using SES as the group variable (low and not-low) and number of opportunities for physical activity as the test variable was conducted. Pearson product moment correlation was employed to determine if there was a relationship between socioeconomic status and whether children perceived that they were physically active because of the MAC.

Results

Of the 50 participant sample 42 students turned in the parental/guardian informed consent form and the child assent form. The demographic breakdown of the sample was 59.50% ($n = 25$) female, 100% ($n = 42$) White, and 16.70% ($n = 7$) with a low SES. The mean age was 10.7 years ($SD = 3.25$). Only 24.39% ($n = 10$) of the sample met the recommended amount of "5 or more" fruits and vegetables per day. Over two-thirds (66.67%, $n = 28$) consumed French fries or chips one or more times and 57.14% ($n = 24$) ate one or more servings of sweets in one day. Children

were more active in the summer than during the school year and on the weekends more so than the weekdays. During the school year weekdays 61.90% ($n = 26$) of children were physically active, 83.33% ($n = 35$) were physically active during school year weekends, 85.71% ($n = 36$) were physically active during summer weekdays, and 97.62% ($n = 41$) were physically active during summer weekends.

Low SES children ($n = 7$) from this sample were less active than not-low SES children ($n = 35$). There was a statistically significant difference in mean number of sports or physical activity programs participated in for low SES ($M = 1.57$, $SD = 0.79$) and not low SES ($M = 4.23$, $SD = 2.00$), $t(40) = -3.432$, $p = 0.001$. However, Pearson's correlation revealed there was not a statistically significant difference between SES and children's perception of access to MAC physically active programs, $r(40) = 0.064$, $p = 0.688$.

Conclusion & Discussion

With the limited sample size in mind, the results from this study showed low income children participated in fewer physical activities than their more affluent peers. However, it cannot be concluded whether the children with different socioeconomic backgrounds perceived they were more active because of their participation in MAC programs differently. The low sample size does not allow for the results to be generalizable but indicates future research needs to be conducted in these areas for confirmation and further findings.

One factor that serves as a limitation to this study was an incredibly low response rate (5.5%) due to three potential reasons: burden, trust, and language. For rural areas, such as Meade County, where residents have a limited experience with research, informed consent protocols, and surveys, the mailing of the Children's Health Surveys to each child's home address may have posed an undue stress or burden to the parent/guardian and/or child. Each survey packet contained a sizable amount of documents: list of directions from the Meade Activity Center's Executive Director, two parental/guardian informed consent forms written in technical, university-language (one to sign and return, one to keep), two child assent forms (one to sign and return, one to keep), the 6-page, 55-item Children's Health Survey, and a stamped, addressed return envelope. To the parent/guardian and/or child, the materials in the packet may have seemed like a time-consuming task of filling out all of the paperwork and mailing it back, causing a low return rate. Previous research has also indicated that surveys are more likely to be returned if it is delivered by someone the participants trust (Edelman, Yang, Guymon, and Olson, 2013). Since the documents were written by someone the participants are not familiar with, they may not have felt comfortable completing them. Literacy and language constraints are also important factors that contribute to participation in research studies (Sinclair, O'Toole, Malawaraarachchi, & Leder, 2012). Together these issues could have played a role in producing a low response rate.

For the future, it has been proposed and confirmed by the Principal Investigator and the Meade Activity Center's Executive Director that the collection procedures will include face-to-face intercept survey data collection conducted by the Principal Investigator and a Meade County resident volunteer. A higher response rate may be obtained by attending the first few sessions of each Meade Activity Center program to pass out forms and surveys while parents/guardians are registering their child(ren), addressing the trust issue by building rapport and reducing burden. By being physically present during data collection as opposed to mailing the surveys, the Principal Investigator and/or community volunteer can explain the purpose of the study, the parental/guardian informed consent form, and the child assent form, eliminating the language barrier. Further, the Principal Investigator can ensure all forms are filled out correctly by the parent/guardian and/or child and answer any questions or concerns about the study. This change in data collection will hopefully increase the response rate and parent/guardian and child's comfort with study participation.

A group of community members recognized their fellow low-income families did not have local places for their children to engage in physical activities. They adopted the loft goal of creating a health equitable community by offering physical activity opportunities for children and adolescents within the county in borrowed spaces until an actual facility could be built. In 2011, the MAC was awarded a prestigious three-year grant with required matching through the Kentucky Healthy Futures Initiative, an award granted from the U.S. Social Innovation Fund, administered through the Foundation for a Healthy Kentucky. A comprehensive, longitudinal, match-comparison study design is being conducted as part of the requirement for the SIF. Cardiovascular and body mass index (BMI) data for over 1,700 children; physical activity, nutrition, and sedentary "screen time" behaviors for 700 children; perceptions of the need of physical activity for over 300 community members; and coalition effectiveness of key stakeholders are among a few of the data being collected, analyzed, and reported. Although the study reported in this paper is a small portion of the larger Meade Activity Center project, its implications are suggestive.

Rural communities must have access to physical activity opportunities and facilities so their residents can be physically active (Dunton, Kaplan, Wolch, Jerrett, & Reynolds, 2009; Trost, Pate, Saunders, Ward, Dowda, and Felton, 1997). A greater variety in opportunities increases the likelihood that children will be more active than if they are only presented with one option (Shores et al., 2010). An increase in both program offers and participants indicates a demand for the Meade Activity Center. The overall enrollment of physical activity programs from the Spring 2012 session to the Spring 2013 session more than doubled from 107 participants to 250 participants. Additionally, from the Summer 2012 session to the Summer 2013 session participants grew from 284 to 306. Furthermore, from the Spring 2012 session to the Summer 2013 session five additional programs were offered and from the Summer 2012 session to the Summer 2013 session three additional programs were offered.

The ultimate goal of MAC is to create physical activity opportunities and places for children who would not have otherwise been able to engage in physical activity. Without the MAC the Meade County children must spend excessive time and money to travel to the closest metropolitan area, Louisville, Kentucky, 42.8 miles away from Meade County, to participate in sports teams and physical activity programs. Considering that children with a low SES cannot afford to travel outside the county to participate in physical activities, the MAC provides all children equal opportunities to be physically active with convenient access and a variety of activities. Further, a sliding fee scale ensures all Meade County children who would not have otherwise had access to physical activity opportunities can participate. Overall, the MAC is a successful program that is highly needed in a rural county. Opportunities are provided for both low SES children and not low SES children to positively help them develop healthy behaviors now for lifelong health.



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