

## ENVIRONMENTAL INFLUENCES ON CHILDREN'S PHYSICAL ACTIVITY AND DIETS IN RURAL OREGON: RESULTS OF A YOUTH PHOTOVOICE PROJECT

Nancy E. Findholt, PhD, RN<sup>1</sup>  
 Yvonne L. Michael, ScD, MS<sup>2</sup>  
 Melinda M. Davis, PhD(c), CCRP<sup>3</sup>  
 Victoria W. Brogoitti, BS<sup>4</sup>

<sup>1</sup>Associate Professor, [School of Nursing](#), Oregon Health & Science University, [findholt@ohsu.edu](mailto:findholt@ohsu.edu)

<sup>2</sup>Investigator, [OCTRI](#), Oregon Health & Science University, [michaely@ohsu.edu](mailto:michaely@ohsu.edu)

<sup>3</sup>Research Scientist, [ORPRN](#), Oregon Rural Practice-based Research Network, [davismel@ohsu.edu](mailto:davismel@ohsu.edu)

<sup>4</sup>Director, [Union County Commission on Children & Families](#)

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### ABSTRACT

Little is known about the effect of the rural environment on children's physical activity and food choices. In this study, six rural adolescents participated in a photovoice assessment to document conditions that influenced children's activity and diets. Physical activity was hindered by inadequate recreational resources, unsafe streets, and distance, but was promoted by the natural environment and support for youth sports. Healthy eating was hindered by busy lifestyles, limited access to healthy foods, access to and promotion of unhealthy foods, and social values, but was promoted by the agricultural setting and gardening. While many of these factors occur in non-rural settings, the findings suggest that rural communities have unique strengths and barriers that must be considered when developing interventions.

### INTRODUCTION

Over recent decades, the prevalence of childhood obesity has increased dramatically in the United States. Recent results from the National Health and Nutrition Examination Survey (NHANES) indicate that nearly 19% of school-age children and adolescents, ages 6 to 19 years, are obese and an additional 16% are overweight (Ogden, Carroll, Curtin, Lamb, & Flegal, 2010). This epidemic is especially severe in rural parts of the country, where obesity rates among children and adolescents have been shown to be higher than state or national averages and higher than rates among youth in urban areas (Joens-Matre et al., 2008; King, Meadows, Engelke, & Swanson, 2006; Lewis et al., 2006). A recent national study found that rural children were 25% more likely to be overweight or obese than their urban counterparts (Lutfiyya, Lipsky, Wisdom-Behounek, & Inpanbutr-Martinkus, 2007). Children who are obese are at risk for many serious physical and emotional health conditions, including type 2 diabetes, hypertension, orthopedic problems, low self-esteem, and depression (Daniels, 2006; Strauss & Pollack, 2003; Wang & Veugeloers, 2008).

It is widely believed that environmental factors are at the root of the obesity epidemic (Miller & Silverstein, 2007). However, research into the links between the environment and children's physical activity and diets is limited at this time (Sallis & Glanz, 2006). This limitation is especially true in regard to the rural environment because nearly all of studies exploring the environmental correlates of children's activity and eating patterns have been conducted in urban or suburban settings (Hartley, 2007).

Although research conducted in urban or suburban areas may provide clues as to the factors that affect children's physical activity and food choices in rural communities, it cannot be assumed that the factors are the same. Many rural communities are characterized by vast distances, low socioeconomic status, transportation challenges, and low public funding levels for facilities, programs, and other public amenities (Phillips & McLeroy, 2004), and these characteristics may contribute to low levels of physical activity and unhealthy diets among children. On the other hand, it is conceivable that the rural environment may be perceived as safer and that rural children may spend more time outdoors and have more access to fresh fruits and vegetables along with less access to fast food restaurants than their urban and suburban counterparts – factors that have been linked to increased physical activity and healthy eating behaviors (Baranowski, Thompson, DuRant, Baranowski, & Puhl, 1993; French, Story, Neumark-Sztainer, Fulkerson, & Hannan, 2001; Hearn et al., 1998; Klesges, Eck, Hanson, Haddock, & Klesges, 1990; Sallis et al., 1993; Timperio, Crawford, Telford, & Salmon, 2004).

In this article, we report the findings of a study that explored the perceptions of rural youth concerning the environmental barriers and facilitators of children's physical activity and healthy eating in their communities. Photovoice was utilized as the method for achieving this goal. Photovoice is a participatory action research methodology that entrusts cameras to people so they can document and discuss community needs and assets (Wang & Burris, 1997). This photovoice project was part of a multi-method community assessment conducted by *U.C. Fit Kids* (Union County Fit Kids), a coalition of community and academic partners who are engaged in community-based participatory research for childhood obesity prevention in Union County, Oregon.

## METHOD

### *Setting and Participants*

Union County is an isolated agricultural region in northeast Oregon that, at the time of the study, had a population of 24,753 people (U.S. Census Bureau, 2007). Most of the residents were Caucasian (94.0%) and the median household income was well below the state average (\$39,873, compared to \$48,735 for Oregon). There were six main communities in the county, one with 12,327 residents and five that ranged in size from 290 to 1,961 residents. Each community had its own school district with a single high school.

A purposive sampling strategy was used to recruit one student from each of the six high schools in the county. To be eligible to participate in the study, a student had to have lived in his or her community for at least eight years and had to have attended the local elementary school. These criteria were established to ensure that the student participants would have an in-depth knowledge of their communities. Of the six students who participated in this study, four were females, all were Caucasian, three were high school seniors, two were juniors, and one was a sophomore. Active parental consent and student assent were obtained at the time of recruitment.

### *Photovoice Procedure*

We followed a procedure similar to one delineated by Wang (2006) to engage the student participants in data collection and analysis. Human subjects approval and study oversight was provided by the Oregon Health & Science University Institutional Review Board. The steps that

were taken are summarized below. For a detailed description of the study procedure, see Findholt, Michael, and Davis (2010).

Three 3-hour photovoice sessions and a final 1-hour session took place between July and October 2007. The sessions were facilitated by a team of two investigators and two graduate students. During the first session, the facilitators led an interactive discussion about environmental influences on children's physical activity and diets, discussed the project goals and ethical issues related to photography, and provided each student with two disposable cameras. A professional photographer provided tips on using the cameras. The students were asked to take pictures of facilitators and barriers to children's physical activity and healthy eating within their communities. They were given one month to complete their photography and return the cameras for processing. At the second session, the students reviewed their photographs and selected those they thought were most important, wrote captions to explain what the photographs meant, shared and discussed their photographs with each other, and identified themes that arose from the photographs. The following questions were used to facilitate the discussion: What do you see here? What's really happening here? How does this affect children's physical activity or food choices? Why does this problem, concern, or strength exist? What can we do about it? Following this session, the facilitators drafted a computerized slide presentation using the students' photographs and captions. At the third session, the students made minor changes to the slides, practiced giving the presentation, and brainstormed about steps that could be taken in Union County to promote physical activity and healthy food choices among children. Finally, at the fourth session, the students presented their findings to members of the *U.C. Fit Kids* coalition and other invited guests. At the conclusion of this session, the students received a \$100 stipend.

## RESULTS

The photographs taken by students revealed several barriers to children's physical activity and healthy eating in this rural county, but also some assets that promoted healthy behaviors. The following represents the major themes that emerged from the photographs and group discussions. To view a sample of the photographs, go to <http://www.eou.edu/ohsu/photovoice.html>.

### *Factors Influencing Physical Activity*

Limited availability of recreational facilities and programs was identified as a primary barrier to children's physical activity. One student photographed her town's boundary sign showing a population of 1,710 and wrote, "This sign shows that our town is very small. Because [it] is so small, the choices for ... physical activity are limited." The perception of having few options for physical activity was widely shared among the students. In addition, existing facilities were frequently described as inaccessible or inadequate. For example, it was noted that: (a) some facilities had not been maintained; (b) few facilities were open after 5 p.m.; (c) some facilities were only available to select groups, such as youth who were involved in sports; (d) some facilities lacked shelter and were too hot to use during summer months; and (e) some parks were perceived as unsafe places for children to play because of the people who might be loitering there.

One exception to the theme of limited resources for physical activity emerged in photographs of the natural environment. Using pictures of nearby lakes, rivers, and wooded

areas, the students explained that these natural areas were commonly used by children and their families as places to play and be active. One student photographed a small lake near her community and wrote that when the water level was sufficient “there are kids there every day with their families.”

It was also noted that organized youth sports were very popular in Union County and provided opportunities for children to be active. For example, one student took a picture of an outdoor basketball court and wrote, “In [my community], sports are extremely supported and inspired. I believe that this sets out a good example for young children to become more active.” Another commented that at least three-quarters of the students in her small school participated in sports. However, during the group discussions, several students observed that only traditional sports such as football or soccer were offered and that there were no structured opportunities for youth to participate in non-traditional activities. Thus, it was difficult for those who lacked an interest in sports to be active. One student said, “I know that, if I’m going to go out and do something, it’s on my own time. For example, going out and snowboarding on the weekend ... I can do that, but it’s not supported by the school. It takes a lot of motivation to go out on your own.”

Many of the students’ photographs focused on community streets, and their captions revealed that the side streets were a primary location where children played and were active. For example, one student took a picture of chalk drawings on a street and observed that few people drove on the side roads in his community so children often played on these streets. On the other hand, several students emphasized that there were few sidewalks or bike lanes in their communities and that the main streets had much traffic, including oversized trucks. Many of the main streets were, in fact, highways, and the students observed that, even when sidewalks or bike lanes were present, it felt unsafe to walk or bicycle on these roads.

Finally, long distances between home and school or play areas were identified as a factor that hindered children’s physical activity. One student, who lived in Union County’s largest community, explained that his home was two miles from school and said, “If we weren’t so sprawled out maybe people would walk more, but most people now just drive.” Likewise, a student living in one of the smallest communities used photographs of pasture land within the city limits to show that, even in small towns, people were “spread out”, and he noted that a local playground was rarely used by children because it was “too far to walk.” However, socio-cultural factors might also influence the decision to get a ride, rather than walk or ride a bike. At least two students observed that many of their peers drove to school even when they lived nearby because it was “cool to drive a car”.

### ***Factors Influencing Food Choices***

A predominant theme in the photographs and stories pertaining to food was that children’s diets were strongly influenced by their home environment (e.g., “Whatever the parents serve for dinner is what the child will consume”). However, the students also identified several factors within their communities which they believed had an effect on the food choices made by youth and their parents.

Busy lifestyles and perceived lack of time emerged repeatedly as significant barriers to healthy eating. The students took pictures of fast food restaurants and prepared foods and explained that parents and youth frequently purchased these foods, even when they knew they

were unhealthy, because: “When you’re running around trying to get things done, it’s just easier to go to McDonalds.”

In addition, limited access to healthy foods was identified by the students who lived in the smallest communities of Union County as a factor that negatively influenced children’s diets. One student, who lived in a town of 490 residents, photographed the produce section of her community’s small market – a single refrigerated shelf holding fewer than two dozen vegetables, such as onions and bell peppers – and noted that, in addition to the limited quantities, these foods were “not what kids would eat anyway [for snacks].”

Unhealthy foods, on the other hand, were perceived by all of the students as being easy to obtain and heavily promoted. Although one student observed that fast food chain restaurants were not common in small communities like her home town, she and other students used photographs of soft drink machines, deli counters, and candy displays to show that high-fat and high-sugar foods were widely available. They also noted that these foods were inexpensive, making them easy for children to access. In addition, the students emphasized that advertisements for unhealthy foods were abundant and that many of the marketing strategies targeted youth. For example, one student took a picture of the breakfast cereals in her local market and pointed out that the heavily sweetened cereals were placed on the lower shelves, where children would easily see them. Another photographed a large candy display located adjacent to the entrance of her community’s market and wrote, “This is what kids first see when they walk into this store.”

Finally, several social values were identified as having a negative effect on children’s diets. One value – that getting a bargain is good – emerged in photographs showing (a) signs advertising a sale on soda and energy drinks, (b) a store refrigerator promoting larger sizes of soda for only 25 cents more, and (c) a large bag of candy with a caption that read, “Sometimes getting larger bags of something can be cheaper and much more appealing.... If you purchase bigger bags of something unhealthy, you will consume more of it.” A second value was expressed by a student who said, “Bigger is better in America – that’s the problem.” He and others talked about the appeal of over-sized portions and all-you-can-eat buffets. In addition, several students noted that food, particularly unhealthy food, was perceived as a treat or a reward. One student took pictures of a McDonald’s Arch Card and a box of fudge brownie mix and explained that these were used by parents as a way to reward or entertain their children.

In contrast to these barriers to healthy eating, Union County’s agricultural setting and the popularity of gardening were identified as factors that promoted healthy food choices because they increased access to healthy foods and helped people to be more aware of nutrition and where their food comes from. One student photographed a cucumber vine and wrote, “In my town, agriculture is very popular. Vegetable gardens and edible crops are a good inspiration to eat organic foods. It’s ... fun to watch them grow, and harvest them as well.” Unfortunately, however, comments such as this one were greatly overshadowed by the larger themes pertaining to unhealthy foods being fast, cheap and popular.

## DISCUSSION

The findings from this study need to be considered in light of the small number of student participants and inclusion of only one rural county. Despite this, the students’ photographs and comments add to the knowledge base about environmental influences on children’s physical activity and diets, especially as these pertain to rural communities.

Some of the findings are consistent with previous research. Recreational facilities have been found to be less common in low-income neighborhoods than in higher-income neighborhoods (Estabrooks, Lee, & Gyurcsik, 2003; Gordon-Larson, Nelson, Page, & Popkin, 2006; Powell, Slater, Chaloupka, & Harper, 2006), and may also be less common in rural than in urban communities (Wilcox, Castro, King, Housemann, & Brownson, 2000). Limited access to recreational facilities and programs has been associated with lower levels of physical activity among children and adolescents (Romero, 2005; Sallis, Prochaska, & Taylor, 2000). Similarly, convenience stores, which offer fewer healthy foods such as fresh fruits and vegetables, are far more common than supermarkets in rural areas and in low-income communities (Liese, Weis, Pluto, Smith, & Lawson, 2007; Morland, Wing, Roux, & Poole, 2002; Moore & Roux, 2006), and some evidence suggests that consumption of healthy foods is influenced by whether these foods are available in local grocery stores (Cheadle et al., 1991; Morland, Wing, & Roux, 2002; Rose & Richards, 2004). In addition, long distances, traffic-related safety concerns, and lack of sidewalks and bike paths have been identified as barriers to walking and bicycling among children (CDC, 2002; CDC, 2005; Ewing, Schroeder, & Greene, 2004; Timperio et al., 2004). Also, previous studies have found that what children eat is influenced by what is available in the home (O'Dea, 2003; Hearn et al., 1998); that less healthy foods are often selected because they are easy and quick (O'Dea, 2003); and that aggressive marketing of unhealthy foods toward children is a factor that leads children to consume these products (Institute of Medicine, 2005; Page & Brewster, 2007).

Among the findings that were unique to this study was that the natural environment was extensively used and appreciated as a resource for physical activity. This is an important health-promoting characteristic because outdoor play has been consistently linked to physical activity among young children (Baranowski et al., 1993; Klesges et al., 1990; Sallis et al., 1993). Interestingly, no safety issues were mentioned despite the fact that use of these resources does present some risk. (For example, there are no lifeguards at the rivers and lakes where children swim.)

Another unique asset that was identified was the popularity of youth sports. In rural communities, youth sports may be particularly popular because there are few other social activities available to the residents. Also, children might be encouraged to participate in sports because, without a high level of participation, there would not be enough players to form a team. Although a strong focus on sports does promote children's physical activity, it is not ideal. Not all children enjoy or are good at traditional sports. Female students, in particular, have reported discomfort in trying out for or participating in sports due to perceived incompetence, perceptions of peer judgments, and the seriousness of participation (Bauer, Yang, & Austin, 2004; Hohepa, Schofield, & Kolt, 2006). Also, as one student in our study noted, not all sports require a high level of physical activity. For example, in baseball, children spend much time standing or sitting. Finally, many sports, such as football, are not life-long activities.

Our findings pertaining to rural streets and their influence on children's physical activity were interesting in that there was a distinct contrast between the perceptions concerning the side streets and those concerning the communities' main roads. The main connecting roads were described as dangerous and a barrier to walking and bicycling. However, the side streets, which had little traffic, were identified as a primary area where children played. Despite low traffic and the perception of safety, the use of side streets as play areas may present safety risks.

The findings pertaining to community sprawl were also interesting because sprawl is a concept that is typically associated with urban areas, where homes are widely separated from

stores and workplaces (Ewing, Schmid, Killingsworth, Zlot, & Raudenbush, 2003). Yet, as our study showed, sprawl is factor that influences physical activity in rural areas as well. People living in the country or on farms have always been spread out, but it was surprising to find that, even in very small communities, sprawl (or the perception of sprawl) was identified as a factor that reduced walking.

In regard to dietary influences, the findings of our study suggest that rural communities are not isolated from the trends that have had a profound negative effect on people's diets in other parts of the country. Lack of time to prepare meals, the appeal of fast food and large portions, and exposure to aggressive marketing of unhealthy foods, among other factors, appeared to have an overwhelming influence on children's diets in Union County. In contrast, Union County's agricultural surroundings and vast number of orchards and gardens were perceived as having only a minor positive effect on children's food choices. Some reasons for the limited effect of the agricultural environment on children's diets were found in other findings from the *U.C. Fit Kids* community assessment. These included Union County's limited growing season and the fact that preserving food was uncommon among young families.

An important strength of the study was that it engaged adolescents who had grown up in Union County and had an in-depth knowledge of their communities in the assessment. This research should be expanded to include adolescent participants from other rural counties. In addition, the participants in the current study suggested that future research allow more photovoice sessions so that students would have more time to research their communities and refine their photographic techniques. In addition, one student suggested that photographs be taken at different times of the year in order to capture environment factors that are important during different seasons.

### **IMPLICATIONS FOR PRACTICE**

While many of environmental factors that were identified in this study as having an influence on children's physical activity and diets also occur in non-rural settings, our findings indicate that rural communities do have unique strengths and barriers that must be considered in the development of interventions. The findings point to the need to increase access to physical activity opportunities for rural children outside of organized traditional sports. Activities that make use of the natural environment may be particularly attractive. There is also a need to increase access to healthy foods, such as fresh fruits and vegetables, especially for children and families who live in small communities that lack supermarkets. In agricultural areas, such as Union County, promoting the use and preservation of locally grown products may be helpful. In addition, it is important to provide children and families with ideas about how to prepare quick and healthful meals and snacks. Again, promoting the use and preservation of local produce may be a useful strategy. Finally, addressing street safety is essential, particularly on the main roads but also on side streets since the streets serve as primary play areas for children.

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