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Pediatrician prescriptions for outdoor physical activity among children: A pilot study

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ABSTRACT

Research indicates that promoting time spent in the outdoors and outdoor physical activity increases children's daily physical activity and improves health. One method showing promise is doctor prescriptions for outdoor physical activity for children; however, no empirical evidence currently exists on prescriptions for children's outdoor physical activity. A pilot study was conducted at one pediatric practice in western North Carolina during 2015 to test the feasibility and potential effectiveness of conducting an outdoor physical activity prescription program for children aged 5–13 years. Three pediatricians wrote prescriptions for children ($n = 38$), discussed benefits of outdoor physical activity, and provided information packets to parents on nearby places for physical activity. Parents of patients of five pediatricians served as control ($n = 32$). Prior to seeing a pediatrician, parents completed a baseline survey that asked height and weight, assessed their views of children's physical activity, and their personal and child's physical activity/sedentary behaviors. A nurse measured children's height and weight. Parents were emailed one-month and three-month follow-up surveys that asked the questions listed above. Changes in children's physical activity, outdoor physical activity, time spent in the outdoors, and sedentary activities were not significant between intervention and control groups. About half of parents (49%) viewed prescriptions as beneficial for their children and most used the intervention materials at home (70%). A larger study is needed to assess whether prescriptions increase children's physical activity. A critical examination of the intervention, pilot study design, and suggestions for a larger future study are provided.

1. Introduction

Children's time spent in the outdoors has been linked with positive health outcomes such as reduced childhood stress, symptoms of attention deficit disorder, depression, anxiety disorder, myopia, asthma, and increased feelings of wellbeing (Coon et al., 2011; Kuo and Taylor, 2004; Lovasi et al., 2008; Maas et al., 2009; Rose et al., 2008; Taylor et al., 2001; Wells and Evans, 2003). The average child, however, spends only four to seven minutes in the outdoors each day (Hofferth and Sandberg, 2001; Juster et al., 2004). Additionally, high prevalence rates of overweight among U.S. children are related to decreased physical activity (PA) levels and increased sedentary behavior, which have been shown to be associated with decreased time spent outdoors (Cleland et al., 2008; Dyment and Bell, 2008). Given the strength of the evidence on the separate health benefits of PA and time spent in the outdoors and the relationship between time spent in the outdoors with participation in more vigorous PA among children, the promotion of outdoor PA is warranted.

The American Academy of Pediatrics has taken a strong stance in defense of PA through recommendations for pediatricians to promote unstructured activity for children and to help parents identify opportunities in nearby parks and open spaces (Daniels and Hassink, 2015; Ginsburg and Committee on Communications and the Committee on Psychosocial Aspects of Child and Family Health, 2007). Physician prescriptions for PA have become more widespread in recent years, fueled by several national initiatives. Examples include the "Exercise is Medicine" campaign which focuses on PA as a vital sign for health (Lobelo et al., 2014; Sallis et al., 2016) and the National ParkRx Initiative (The National ParkRx Initiative, 2016) which emphasizes the use of parks and other public lands to improve the overall health and wellness of a community. In addition, the National Physical Activity Plan, most recently launched in April 2016 lists four specific strategies that focus on health care providers and their ability to promote and discuss PA with their patients (The National Physical Activity Plan Alliance, n.d.). Clearly, pediatricians can act as the agent of awareness to promote outdoor PA and discuss the health benefits. Pediatricians, however, often do not receive adequate training and education on the specific benefits of PA and the best methods for communicating these to patients and parents (McCurdy et al., 2010). Programs that use prescriptions have found that providing additional resources to pediatricians such as brochures

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and websites that map locations of outdoor places for children to be active are useful in facilitating the communication between doctors, patients, and their parents (National Recreation and Park Association, 2014). Most research conducted on PA prescription programs has focused on adults (Galaviz et al., 2012), program distribution (Petrella et al., 2007), program evaluation (Aittasalo et al., 2006), and prescription program acceptance by general practitioners (Rowland et al., 2007). Of the limited studies that have been done with children, few have had control groups while others had little success increasing PA in unmotivated patients (Ortega-Sanchez et al., 2004; Patrick et al., 2001; Rowland et al., 2007; Saelens et al., 2002). Nonetheless, there is little empirical evidence supporting the use of prescriptions for children and youth (Rowland et al., 2007) specifically targeting outdoor PA.

The purpose of this pilot study was to assess the potential effectiveness and feasibility of conducting an intervention involving health care providers talking to their patients and parents about the importance of outdoor PA and prescribing outdoor activity for children. The project focused on a rural area that provides many local outdoor opportunities, but the need for awareness of the importance of outdoor activity and places for activity still exist (Parks et al., 2003). The study hypotheses were that an increase in children's daily PA levels and time spent outdoors and a decrease in time spent in sedentary activity would be seen among those who received the intervention while no changes would occur among children in the control group.

2. Method

This pilot study with longitudinal data collection, was conducted from August to December 2015 at the sole pediatric medical office that serves one rural county in the Appalachian Mountains of western North Carolina. The study outcome variables were children's PA and outdoor PA, sedentary behaviors, and child's time spent outdoors. The university's institutional review board approved all study procedures.

2.1. Participants

Parents with children 5–13 years of age living in the county served by the pediatric office were eligible to participate in the study. Upon check in for a well-child visit parents were given a survey packet that included the informed consent, description of the study, instructions, and a baseline survey. Parents were not asked to participate if a reason for their child seeing the pediatrician was due to the child being sick or injured. One parent completed the healthcare provider baseline survey in the office waiting room prior to seeing their child's pediatrician. Seventy-one parent-child dyads were recruited for the study ($n_{\text{intervention}} = 38$; $n_{\text{control}} = 33$). Loss to follow-up resulted in a final sample size of 70 ($n_{\text{intervention}} = 38$; $n_{\text{control}} = 32$).

2.2. Intervention

Three pediatricians delivered the intervention during regular annual well-child visits. Patients and their parents that were scheduled to see one of these three pediatricians received the intervention while patients and parents that were scheduled to see any of the other five pediatricians did not receive the intervention. The intervention took from 4 to 6 min to deliver.

The prescription program consisted of pediatricians talking to patients and their parents about the importance of getting 60 min or more of PA per day in the form of outdoor PA and provided information about places in the local community to go for outdoor activities. Pediatricians wrote the children prescriptions to get 60 min or more of outdoor PA per day and parents were provided information resources. The information resources consisted of: a folded outdoor topographical map showing the locations of places with opportunities for outdoor PA within the region; a brochure with information concerning the importance of outdoor PA and strategies that parents can use to make sure their children are getting 60 min or more of outdoor activity per day; a leaflet with free mobile phone applications that patients and parents can download that provide additional resources; a laminated one-page information sheet that depicted the benefits of outdoor activity for children; and several leaflets provided by the regional Kids in Parks TRACK Trails program (a national system of family-friendly trails that include self-guided brochures and signs that enhance the outdoor experience).

2.3. Data collection

To evaluate the effectiveness of the intervention, three surveys were completed by parents: 1) at baseline in the pediatrician office waiting room; 2) at one month after the pediatrician visit; and 3) at three months after the pediatrician visit. The baseline survey assessed demographic variables of parent and child including sex, age, race/ethnicity, parent level of education, total household income, parent marital status, and parent self-reported height and weight. At baseline, a nurse recorded the child's height and weight after being measured as part of the pediatrician office visit.

The surveys consisted of items taken from previously validated instruments. Child's PA was assessed using the standard Youth Risk Behavior Surveillance System (YRBSS) item adapted for parent report asking for the number of days during the past week that the child was physically active for a total of at least 60 min per day. Outdoor specific PA was assessed with a similar question that asked for the number of days during the past week that the child was physically active outside for a total of at least 60 min per day. The Godin Leisure-Time Exercise Questionnaire (LTEQ) was used to assess frequency of PA participation using a 5-point scale anchored by 1 (*Never*) and 5 (*Always*) with higher scores indicating greater frequency (Godin and Shephard, 1997). A similar item measured frequency of outdoor PA. The LTEQ has been shown to be valid for use with children (Sallis et al., 1993a).

Sedentary behavior was assessed through two questions asking for the amount of time during an average weekday and weekend day that the child spends in sedentary activities such as sitting while listening to music, watching TV, playing video games, using a computer or tablet/iPad, doing homework, reading, etc. These questions were asked on a 7-point scale from “none” to “5 or more hours per day.”

Time spent outdoors was assessed by asking how often the child spends time outdoors such as outside in the backyard, neighborhood, etc. The item was asked on a 5-point scale from “never” to “always.”

To evaluate the feasibility of conducting the intervention, the 1-month and 3-month follow up online surveys asked parents in the intervention group additional questions related to use (specific type and frequency) of the intervention materials. These surveys also asked whether the parent viewed the prescriptions as beneficial to their child's PA levels.

2.4. Data analyses

All statistical analyses were conducted using IBM SPSS Statistics, version 24 (IBM Corp., Armonk, N.Y., USA). To test whether children's daily PA levels, outdoor PA, and time spent in the outdoors increased and time spent in sedentary activity decreased from baseline to 3-month follow up in those who received the prescription program compared to the control, generalized estimating equations (GEE) were conducted. The GEE analyses modeled the variability within physicians and examined the simple effects for differences across the three time periods (baseline, 1-month, and 3-month) and group (prescription program compared and control) and the interaction between the two. The alpha level was set at $p < 0.05$.