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Barriers to Parent Support for Physical Activity in Appalachia

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Abstract

Background—Parent support for child physical activity is a consistent predictor of increased childhood activity. Little is known about factors that prevent or facilitate support. The purpose of this research was to identify barriers to parent support for child physical activity in Appalachian parents.

Methods—A cross-sectional study assessed parents whose children participated in CARDIAC screenings in a rural Appalachian state. Barriers to parental support for physical activity, demographics, geographic location, and parental support for activity were measured.

Results—A total of 475 parents completed surveys. The majority were mothers (86.7%), parents of kindergarteners (49.5%), white (89.3%) and living in a non-rural area (70.5%). Community-level factors were most frequently cited as barriers, particularly those related to the built environment. Rural and low-income parents reported significantly higher barriers. Community, interpersonal, and intrapersonal barriers were negatively correlated with parent support for child physical activity. Parents of girls reported a higher percentage of barriers related to safety.

Conclusion—Reported barriers in this sample differed from those reported elsewhere (Davison, 2009). Specific groups such as low-income and rural parents should be targeted in intervention efforts. Future research should explore gender differences in reported barriers to determine the influence of cultural stereotypes.

Keywords

Obesity; Obesogenic; Youth; Built Environment

Introduction

Parent support for child physical activity has been identified as a significant predictor of increased child physical activity^{1–5}. Parent support, including instrumental, emotional, and participatory support, is stronger in parents of boys^{1, 6, 7}, and decreases with age for both genders⁸.

Previous findings suggest that increasing parent support for physical activity could have a positive influence on increasing child physical activity^{3–5}, however little research has been done to identify the barriers to support. To address this problem, Davison⁹ developed the Barriers to Activity Support Scale (BASS) and surveyed families in a mid-sized city in New York. Common barriers included: desire to promote academic achievement, lack of facilities, and concerns for child safety⁹.

Identified barriers within an urban setting may not be representative of suburban or rural environments and experiences. Rural areas are often characterized by health disparities including increased rates of chronic disease such as obesity and unhealthy lifestyle patterns including inactivity¹⁰. Rural communities, such as those in Appalachia, present unique challenges concerning the availability of, and opportunity for, physical activity¹². Lack of sidewalks, walking and biking trails, and decreased access are examples of such challenges. Additionally, lack of resources can impede physical activity, as improved access to programs and facilities is positively associated with increased physical activity². Rural adolescents are more likely to be overweight than their suburban counterparts¹³. Thus, identifying ways to increase physical activity is imperative to reducing obesity and increasing overall health in rural areas.

Previous research suggests that there is a positive relationship between socioeconomic status (SES) and child physical activity^{14, 15}. This may be due to the increased availability of physical activity resources and equipment that would likely come with increased financial resources. Additionally, parents with higher SES may be more educated about or aware of the benefits of child physical activity.

According to the Social Ecological Model, behavior is influenced by interdependent domains¹⁶. Thus, it is important to explore the influence of multiple domains when researching parent support. Factors influencing physical activity can be found at the community, interpersonal, and intrapersonal levels¹⁷.

The purpose of this study was to identify the most commonly experienced barriers in a sample of Appalachian parents, and to further explore if certain subgroups experienced disproportionate barriers. In this study, we explored: 1) the most common parental support barriers; 2) the relationship between child gender and barriers; 3) the relationship between

rurality and barriers; 4) the relationship between income and barriers; and 5) the associations between types of barriers and parental supportive behavior.

Methods

Participants consisted of families of kindergarten, second, and fifth graders who participated in the Coronary Artery Risk Detection in Appalachian Communities (CARDIAC) project screening during the 2010/2011 school year. The CARDIAC project screens school children throughout West Virginia to identify children at-risk for cardiovascular disease¹⁸. During the statewide screening, parents completed items related to family and child demographics and family history of cardiovascular risk factors such as heart disease, hypertension, and diabetes on the screening/consent form. Once completed, trained CARDIAC staff and volunteers measured children's height and weight. Body mass index percentile (BMI) was calculated for each child¹⁹. Children's height and weight were measured using the SECA Road Rod stadiometer (78"/200 cm) and the SECA 840 Personal Digital Scale. Participating CARDIAC families in eight counties completed questionnaires sent to parents along with their child's CARDIAC results. Interested parents completed and returned the questionnaire to the CARDIAC office in a pre-paid envelope.

In eight counties, 2,315 parents participated in the CARDIAC screening and 482 returned the follow-up questionnaires (21%). Independent samples t-test showed a significant difference in child BMI percentile between children of parents who completed the questionnaire ($M=63.19$, $SD=28.74$) and children of parents who did not complete the questionnaire ($M=69.68$, $SD=27.17$); $t(2314)=4.61$, $p<.01$. Eight questionnaires were excluded from analyses due to children with physical conditions that impacted their ability to be physically active. This research was approved by the West Virginia University Institutional Review Board.

Measures

Barriers to Activity Support—Barriers to support for child physical activity were assessed with a modified version of the Barriers to Activity Support Scale developed by Davison⁹. The questionnaire asked "*Please indicate if you agree that each of the following keeps you from helping your child to be physically active.*" Response options were based on a 5 point Likert-type scale ranging from *strongly disagree* (1) to *strongly agree* (5). Due to questionnaire length limitations, some questions from the original BASS were combined or eliminated. Due to the rural nature of the state and suspected regional barriers several questions were added to the pre-existing scale (see table 1). All variables in Table 1 were summed to create a "total barriers" variable ranging from 25–127. As in the original BASS, questions endorsed by fewer than 10% of respondents were not included in analysis⁹.

Questions in the modified BASS were categorized into the following eight types based the original questionnaire: Availability and Accessibility of programs; Safety; Transportation/Infrastructure; Family Commitments and Lack of Social Support; Family Resources; Child Factors; Parent Knowledge and Experience with PA; and Parent Lack of Time and Energy. Internal reliability was calculated with Cronbach's alpha for each of the eight types and is presented in Table 4. "Family Resources" (.79) and "Availability and Accessibility of

programs" (.75) had the strongest internal validity. Each type was then correlated with Parental Supportive behavior scores with Bonferroni correction.

Demographic variables—Child gender, grade, and race were collected on the child's screening form. Income level was assessed on the parent questionnaire with the following question: *Does your child qualify for free or reduced lunch?*

Rurality—To evaluate the influence of rural location on parental supportive behavior, Rural Urban Commuting Area Codes (RUCA) were used to classify individuals based on their residential zip code. RUCA is a commonly used²⁰ sub county rural/urban classification based on population density and population commuting patterns. There are 33 classifications, which are typically divided into 2–4 groups, ranging from rural, small town, large town, and urban²⁰. For the purposes of this study, a dichotomous rural/non-rural measure was used.

Parental Supportive Behavior—Questions assessing five supportive behaviors²¹ were combined to create a composite scale to measure parental supportive behavior. Specifically, parents were asked: *How often do you 1) Transport your child to a place to be physically active; 2) Encourage your child to be physically active; 3) Praise your child for being physically active; 4) Watch your child play sports or be physically active; and 5) Take part in physical activity with your child.* Response options included: *Never/Almost never 1); Monthly 2), Weekly 3), Almost Daily 4), and Daily 5).* Cronbach's alpha was used to measure internal reliability and was .75 in this sample. An average of the five questions was calculated to obtain a score ranging from 1–5. If participants completed at least three of the questions their score was included in analysis.

Statistical Analysis

Data analysis consisted of descriptive statistics including frequencies, percentages, means, and standard deviations. Internal reliability was calculated for each subcategory in the modified BASS. Correlation coefficients were calculated with Pearson product-moment correlation to assess the relationship between each subcategory and parental supportive behavior. Variables were tested for skewness and kurtosis and had acceptable normality of $+/-1$. Independent sample two-tailed t-tests were used to test the differences between the grouped subcategories on the parental supportive behavior. All analyses were conducted with SPSS Statistical software, version 21²².

Results

A total of 475 parents were included in analysis. The majority were mothers (86.7%), parents of kindergarteners (49.5%), white (89.3%) and living in a non-rural area (70.5%). Mean parental supportive behavior was 3.53(.71) with a range of 1.2–5.0 and mean total barriers score was 71.22(17.59) with a range of 25–127 (see Table 2). Parents of girls reported significantly lower levels of support for physical activity ($M=3.43$; $SD=.69$) compared to parents of boys ($M=3.43$; $SD=.69$); $t(465) = -3.17$, $p=.002$. There was also a significant difference in levels of support where parents of children who participated in the free or reduced lunch program (lower income) reported significantly higher levels of

parental support ($M=3.64$, $SD=.77$) than did parents of children who did not participate (higher income) ($M=3.47$, $SD=.68$); $t(329) = -2.31$, $p < .05$. Significantly higher levels of parent support were reported among non-rural parents ($M=3.58$, $SD=.73$) compared to rural parents ($M=3.41$, $SD=.67$); $t(462) = 2.23$, $p=.026$.

The most frequently cited barriers to support for child physical activity were community-level barriers (see Table 4). “There are too few indoor places to be active near my home” was either agreed or strongly agreed with by 54.9% of parents. Among parents of girls the most frequently cited barrier was “There are no sidewalks for my child to walk or ride on,” agreed or strongly agreed with by 60% of parents. Among low income parents, the most frequently cited barrier was “There are too few indoor places to be active near my home.” This was also the most frequently cited barrier for parents of kindergarteners and parents of 5th graders (see table 3). Parents of children who participated in the free or reduced lunch program (lower income) reported significantly higher total barriers ($M=74.47$, $SD=17.45$) than did parents of children who did not participate (higher income) ($M=69.18$, $SD=16.67$); $t(459) = -3.86$, $p < .01$. Additionally, significantly higher barriers were reported among rural parents ($M=75.52$, $SD=14.85$) compared to non-rural parents ($M=69.62$, $SD=17.88$); $t(466) = -3.4$, $p=.01$. Differences in total barriers experienced by parents of girls ($M=72.88$, $SD=17.47$) and parents of boys ($M=69.86$, $SD=17.05$) was approaching significance, $t(469) = 1.90$, $p=.058$.

All types of barriers had a significant negative correlation with parental supportive behavior with the exception of safety (see table 4).

Discussion

The purpose of this study was to identify the most common barriers to child physical activity in an Appalachian sample and to explore if there were unique barriers among demographic subgroups. The most common barriers found were community-level. The six most frequently selected barriers were related to built-environment, safety, and transportation. Subsequent barriers included parent time constraints, program restrictions, limited playmates/peers, and financial limitations. In contrast to the study conducted by Davison, concerns about school performance were not reported by many in this sample⁹. Safety concerns and built environment concerns were similarly reported.

When assessing barriers and child gender differences, the results showed that parents of girls did report greater barriers to support, however the difference was not significant. This could be due to not having a large enough sample size. There might also be some protective factors for girls in rural areas, such as culturally emphasized strength and athleticism that may actually promote support for physical activity. Future research should further explore the influence of location and differences in barriers among genders.

Parents in rural areas experienced greater barriers to support for physical activity than parents in non-rural areas. This is unsurprising due to previously identified deficits of physical activity resources in rural areas^{10, 11}. Additionally, parents in rural areas reported lower levels of support for child physical activity. Intervention research should be aware of

these deficits when addressing support for child physical activity. There could also be problems with current measures of physical activity and perhaps they should be expanded to capture traditionally rural activities such as farming.

Lower-income parents experienced significantly greater barriers than did higher income parents. This might reflect support for organized physical activity more so than non-organized. Organized activity is more likely to require resources such as fees, uniforms, and transportation. Future research should find ways to measure parental support for unstructured physical activity. Efforts should be made in future research to assess parent support for both structured and non-structured forms of physical activity. Interestingly, high income parents reported lower levels of parent support for physical activity. This may be due to demands associated with being two-income family.

All types of barriers except safety concerns were significantly correlated with parental supportive behavior. This indicates that addressing barriers to support would be an effective way to start increasing parent support with the ultimate goal of increasing child physical activity. Based on these findings, working to improve the built environment (a commonly reported barrier among all demographic subgroups) should be a priority, particularly in rural areas. Additionally, using existing resources such as school gyms and playgrounds, could improve access to physical activity resources.

There are several limitations in this study. The measure of rurality was based on a community-level variable and parental supportive behavior is an individual level variable, leading to some risk of ecological fallacy and non-independence of data. This project used cross-sectional data, therefore causality cannot be determined. All parent data is self-reported and subject to bias. There is a low response rate, which also makes generalization difficult. All parents granted active consent for participation in screening, which could make them different from parents who did not grant consent. Parents who grant consent for the screening may be different from those who do not and among those screened only a small percentage completed the questionnaire. Finally, while we are measuring rural and urban areas, it should be noted that the entire sample is from central Appalachia and our non-rural sample could be considered rural by some due to the lower population in the region. As a result, comparison between rural and urban groups in this sample might not reflect true differences between these groups in the population.

Future research should assess the impact of built environment on parent support for physical activity. In rural communities, efforts should be made to increase low-cost physical activity that takes advantage of existing resources. Walking trails and after hours school and church facility access might be some potential options. Additionally, raising awareness of ways to increase activity at home might be the most cost-efficient way to realistically increase physical activity in this population.

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Table 1

Community, Interpersonal, and Intrapersonal Barriers Reported by Parents

Community Based	Interpersonal	Intrapersonal
<u>Availability and Accessibility of Programs</u> <ul style="list-style-type: none"> • There are not many teams/programs in our neighborhood • There are too few indoor places to be active near my home • There are not many afterschool/summer programs that include physical activity in my community * • There are no places to be active during bad weather. <u>Safety</u> <ul style="list-style-type: none"> • Cars drive too fast for my child to play near the road • The road we live on is dangerous to walk or bike on * • There are no sidewalks for my child to walk or ride on. <u>Transportation/Infrastructure</u> <ul style="list-style-type: none"> • I have a hard time transporting (driving) my child to events or places to be physically active * • I live too far away from most events or places where my child could be physically active * • There are no playgrounds/parks that my child can walk or bike to. 	<u>Family Commitments and Lack of Social Support</u> <ul style="list-style-type: none"> • My child does not have a sibling to play with • My child has no friends close by to play with • It is hard to plan activities for children of different ages • Lack of support from family and friends makes it hard to help my child be active. <u>Family Resources</u> <ul style="list-style-type: none"> • I cannot afford enrollment fees for sports programs/classes • It is too expensive to get to places where my child can be active • It costs too much money to help my child be physically active 	<u>Child Factors</u> <ul style="list-style-type: none"> • My child prefers to do other "non-active" things • My child has a lot of homework to do each night • It is more important that my child get good grades than be active. <u>Parent Knowledge and Experience with PA</u> <ul style="list-style-type: none"> • I do not know what sports/activities are available in my community • My weight makes it difficult to be active • I am not physically active <u>Parent Lack of Time and Energy</u> <ul style="list-style-type: none"> • My partner and I work and have little time at the end of the day • I have no energy to help my child be active • As a parent, I juggle too many things to help my child be active

* Questions not included on the original BASS

Table 2

	N (%) M(SD)	Mean Parental Supportive Behavior	Mean Total Barriers
N	475	3.51(0.71)	71.22(17.59)
Mean Parent Age	36.67(7.43)		
Who completed form			
Mothers	412(86.7%)	3.50(.71) *	72.11(17.12) *
Fathers	37(7.8%)	3.76(.62) *	65.14(16.22) *
Child Gender			
Male	235(49.5%)	3.64(.72) *	69.86(17.05)
Female	240(50.5%)	3.43(.69) *	72.88(17.47)
Rurality			
Rural	137(28.8%)	3.42(.67) *	75.52(14.86) **
Non-rural	335(70.5%)	3.58(.73) *	69.62(17.88) **
Grade			
Kindergarten	235(49.5%)	3.56(.72)	70.30(17.23)
Second	156(32.8%)	3.54(.72)	71.83(17.97)
Fifth	84(17.7%)	3.49(.68)	73.52(16.18)
Free or reduced lunch			
Eligible (Low income)	176(37.1%)	3.64(.77) *	75.47(17.45) *
Not eligible (High income)	287(60.4%)	3.48(.68) *	69.18(16.67) *
Race			
White	424(89.3%)	3.55(.70) *	70.83(17.21) *
Non-white	35(7.4%)	3.23(.79) *	77.47(15.40) *

*
p .05**
p .01

Table 3

Most frequently cited barriers to parent support for child physical activity

Question	Whole Sample N(%) N=470	Girls N=240	Boys N=230	High income N=287	Low income N=176	K N=235	2 nd Grade N=156	5 th Grade N=84	Non-rural N=335	Rural N=137
1. There are too few indoor places to be active near my home.	261 (54.9)	129(53.8)	132(56.4)	155(54)	101(57.4)	128 (54.5)	86(55.1)	47(56)	165(49.3)	95(69.3)
2. There are no sidewalks for my child to walk or ride on.	255 (53.7)	144(60)	111(47.4)	161(56.1)	90(51.1)	118(50.2)	94(60.3)	43(51.2)	178(53.1)	76(55.5)
3. There are no playgrounds/parks that my child can walk or bike to	234(49.3)	125(52.1)	108(46.2)	146(50.9)	84(47.7)	107(45.5)	81(51.9)	46(54.8)	158(47.2)	74(54.0)
4. There are no places to be active during bad weather	225(47.4)	116(48.3)	109(46.6)	129(44.9)	93(52.8)	109(46.4)	74(47.4)	42(50.0)	138(41.2)	84(61.3)
5. Cars drive too fast for my child to play near the road	222 (46.7)	123(51.3)	98(41.9)	125(43.6)	95(54.0)	112(47.7)	66(42.3)	44(52.4)	146(43.6)	73(53.3)
6. The road we live on is dangerous to walk or bike on *	189 (39.8)	110(45.8)	78(33.3)	112(39)	75(42.6)	89(37.9)	66(42.3)	34(40.5)	123(36.7)	65(47.4)
7. My partner and I work and have little time at the end of the day	159(33.5)	76(31.7)	82(35)	112(39)	45(25.6)	73(31.1)	51(32.7)	35(41.7)	107(31.9)	51(37.2)

Question	Whole Sample N(%) N=470	Girls N=240	Boys N=230	High income N=287	Low income N=176	K N=235	2 nd Grade N=156	5 th Grade N=84	Non-rural N=335	Rural N=137
8. There are not many afterschool/summer programs that include physical activity in my community*	135(28.4)	74(30.8)	61(26.1)	70 (24.4)	61(34.7)	64(27.2)	44(28.2)	27(32.1)	88 (26.3)	46(33.6)
9. My child has no friends close by to play with	124(26.1)	66(27.5)	57(24.4)	80(27.9)	41(23.3)	61(26)	38(24.4)	25(29.9)	82(24.5)	40(29.2)
10. I cannot afford enrollment fees for sports programs/classes	117 (24.6)	66(27.5)	51(21.8)	31(10.8)	84(47.7)	57(24.3)	41(26.3)	19(22.6)	81(24.2)	35(25.5)

* Not included on original BASS

Bold text indicates greatest barrier for demographic subgroup.

Table 4

Community, Interpersonal, and Intrapersonal Barriers

Barriers	Internal Consistency Coefficients	Mean (SD)	Correlation with Parent Support
Community-level barriers			
Availability and Accessibility of Programs	.75	2.92(.92)	-.176 [*]
Safety	.68	3.14(1.08)	-.125
Transportation/Infrastructure	.64	2.55(.96)	-.213 [*]
Interpersonal-level barriers			
Family Commitments and Lack of Support	.55	2.25(.77)	-.244 [*]
Family Resources	.79	2.29(.94)	-.179 [*]
Intrapersonal-level barriers			
Child factors	.32	2.39(.65)	-.176 [*]
Parent knowledge and experience with PA	.58	2.18(.77)	-.289 [*]
Parent lack of time and energy	.71	2.39(2.39)	-.323 [*]

*
p<.006