

**A Delphi Study Identifying Indicators and Criteria for Physically Active
Communities for Youth 10-14 Years Old**

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Abstract

This study engaged community-specific health professionals and stakeholders in the design of an objective instrument to measure indicators and criteria of physically active healthy communities for youth 10-14 years old. Various forms of quantitative (Web-Delphi survey) and qualitative (extensive literature review) evidence were used to identify key measures of community-level support for youth involvement with physical activity. The results of the study provided implications for how three entities found within any community-- home, school, and local government--can be more encouraging for youth to participate in more healthy physical activity. Understanding how physical activity can be facilitated and promoted among youth will have a significant impact on providing and sustaining healthy communities for the future.

Key Words: Youth physical activity, healthy community support

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Introduction and Review of Literature

In examining current trends regarding public health in the United States, it is critically important to assess the health of individuals as well as communities by considering the physical, mental, social, political, and environmental variables related to the quality of life (Brownson, Hoehner, Day, Forsyth, & Sallis, 2009; Docksaï, 2009; Ewing, Schmid, Killingsworth, Zlot, & Raudenbush, 2003). The prevalence and increased number of diseases and harmful health conditions like high blood pressure and Type II diabetes associated with a lack of physical activity has increased in recent years especially among young people in the United States. The publication *Healthy People 2010* (U.S. Department of Health and Human Services, 2000) indicated that overweight and obesity as 1 of the 10 leading health indicators and targeted the need to substantially reduce the number of youth who are overweight or obese (Daniels, 2006).

Researchers (Singh, Kogan, & van Dyck, 2010a) stated that between 2003 and 2007, "obesity prevalence increased by 10% for all US children aged 10 to 17 and by 18% for female children" (p. 604). The relationship between childhood obesity and physical inactivity is closely linked and well reported in the literature (Ball & McCargar, 2003; Bassuk & Manson, 2005; Sallis & Owen, 2002). Furthermore, participation in youth sports and other physical activities during childhood and adolescence years form the foundation to develop favorable attitudes toward active healthy lifestyles as adults (Telama et al., 2005). Although community youth sport programs and activities provide a valuable opportunity for exercise and physical activity (Katzmarzyk & Malina, 1998), participation in organized youth sports programs for non-elite participants decreases dramatically when children are 10-14 years old. Among reasons for decreased participation are the development of new social relationships, changes in body per-

ception and image, biological changes, increased television watching, and negative attitudes towards physical education and physical activity (Allison, Dwyer, & Makin, 1999; Koplan, Liverman, & Kraak, 2005; Singh et al., 2010a; Trudeau & Shephard, 2005). In this regard professionals must find better ways to promote healthy physical activity so that youth will increase their participation in physical activities as they age (Bocarro, Kanters, Casper, & Forrester, 2008).

As community planners, health professionals, educators, and park and recreation professionals consider ways to promote active healthy living in their communities for youth, "little research has addressed the efficacy of such initiatives for increasing physical activity in children and youth" (Pate et al., 2006, p. 7). A few reliable and valid sets of indicators measure the health of a community or how well it supports physical activity among its youth 10-14 years old. Evaluating the validity of these measures is difficult and has only been comprehensively studied by a limited number of research studies (Brownson et al., 2009). Few studies have addressed the indicators and criteria of healthy physically active communities from a youth perspective. It is much more likely that physical activity measures vary by age, community (Kelly et al., 2006), neighborhood socioeconomic conditions and the built environments in those neighborhoods (Singh & Kogan, 2010). "The odds of a child's being obese or overweight were 20–60 percent higher among children in neighborhoods with the most unfavorable social conditions such as unsafe surroundings; poor housing; and no access to sidewalks, parks, and recreation centers than among children not facing such conditions" (Singh et al., 2010b, p. 503). As a result, researchers and other health professionals "lack an empirically based, actionable set of community-level indicators that can be used to measure progress" (Brennan Ramirez et al., 2006, p. 516).

Due to the gap in research, this study engaged community-specific health professionals and stakeholders in the design of an objective instrument to assess the indicators of physically active healthy communities for youth 10-14 years old. For the purposes of this study, indicators were defined as those factors related to individual youth or community levels of physical activity within the community, while criteria were defined as the conditions associated with each indicator. This study implemented various forms of quantitative (Delphi survey) and qualitative (extensive literature review) evidence to identify key indicators and criteria for assessing community-level support for youth involvement in physical activity. Specifically, the research focused on identifying those indicators and criteria that support youth 10-14 years becoming engaged in a physically active healthy community.

Methodology

The methodology used in this study replicated Brennan, Ramirez, et. al, (2006) which combined evidence-based research and expert panelists. Key indicators and criteria were identified using the following process:

Step 1. A comprehensive review of literature and research was conducted to identify and synthesize measures, indicators, tools, and databases. Key findings were obtained from 90 publications including empirical academic articles, governmental reports, and papers from organizing bodies (e.g., WHO) published between the years of 1991 and 2010.

In order for an article to be eligible for consideration for this study, the authors acknowledged and/or examined the characteristics and/or features they believed were important qualities contributing to a city being classified as “healthy” and the ability for youth within a community to be healthy and physically active. Additionally, the review of literature also included studies identifying obstacles such as deficits in health education and limited green

spaces that needed to be overcome in order for a community to be considered healthy. Many of the publications used in the review of literature obtained their findings using case study analysis from specific national and international communities while a number of studies examined the success of the Healthy Cities project initiated by the WHO in 1987. It was determined the literature review had reached saturation when the themes became repetitious in the articles.

A content analysis was then conducted on each publication with key terms being extracted and entered into a database. From this database consisting of 2,250 terms, nine key themes emerged: urban/built environment; social environment; political environment; natural environment; economic environment; behavior; living conditions; health; and facilities/programs. Within the context of these themes, a list of potential indicators of a healthy community for youth was developed which resulted in 13 indicators and 188 criteria statements.

Step 2. The Delphi technique, which is a “widely used and accepted method for gathering data from respondents within their domain of expertise” (Hsu & Sandford, 2007, p. 1), was conducted to further identify and refine the list of indicators and criteria. Typically conducted in two or three rounds, the Delphi method is a tool used for consensus building. For this study, a modified Delphi (Custer, Scarcella, & Stewart, 1999) was implemented. This modified Delphi technique was consistent with the traditional Delphi in terms of methodology (i.e., several rounds of questionnaires with selected panel of experts) and the intent (i.e., to reach consensus among the expert panelists). The primary modification to the Delphi was in the preliminary survey round in which key items were identified to be included in the initial questionnaire. For this phase, since the researchers had conducted a thorough content analysis of key terms, these results were used rather than have the expert panelist spend the time to develop the items. The primary advantage of using this

modification to the Delphi process was that it reduced a significant amount of time for the expert panel that allowed them to focus more time during rounds 1 and 2 identifying specific indicators and criteria for the 10-14 year olds population. Another advantage of using this modification was that it was hoped that it would improve the initial response rate in round 1 while still providing a solid foundation from the content analysis.

Since the aim of this research was to assess the degree of consensus/dissent of the expert panel, only two rounds were necessary. An online modified Delphi was conducted in Fall 2011 using an expert panel consisting of a diverse group of 13 professionals, from a Midwestern community of 75,000, who were knowledgeable about 10-14 year olds. The panel included: four health professionals, two elementary school teachers, four middle school health and physical education teachers, two community parks and recreation professionals, and one YMCA youth development professional.

Results

The first round of the Delphi process requested the panelists to examine and rate 13 indicators and 188 criteria statements of physically active healthy community characteristics. Panelists were asked to rate each indicator and criteria using a 7-point Likert scale denoting whether they perceived the statement to be a poor (1) or excellent (7) choice when describing communities in general. In this phase of the study, the researchers were interested in learning if the panelists perceived this “phrase or term” as useful in identifying both the indicator and criteria. Results from this round were analyzed using frequency, mean scores, and standard deviations of each response. Indicators and criteria representing a degree of consensus as performing poorly or ideally were identified. Positive consensus for item inclusion was defined as respondents scoring an item with a

mean of 5.00 or more and a median score of at least 5.00. Of the original 13 indicators and 188 criteria, all 13 indicators remained but the number of criteria was reduced to 88. Three new statements, suggested by the panelists, were identified and added to the second round questionnaire.

The purpose of the second round of the Delphi study was to further build on the emerging consensus of the panel members from Round 1. For this second round questionnaire, the remaining 13 indicators and 88 criteria statements were returned to the panelists in a format similar to that used in Round 1. Panelists were again asked to rate each indicator and criteria using a 7-point Likert scale denoting whether they perceived the statement to be a poor (1) or excellent (7) choice when describing communities in general. Additionally, each statement’s mean score from Round 1 was included to allow panelists to see the ranking for each statement as they considered the performance of each indicator and criteria identified to assess a healthy community for youth. At the completion of the Delphi, five indicators and 28 criteria emerged with consensus as a positive measure for use in identifying physically active healthy communities for youth. Positive consensus was defined as 70% or more of the respondents scoring an average of 5.00 or more, a median score of at least 5.00, and a mode score of 7.00 out of a possible score of 7.00. Table 1 illustrates the final listing of indicators and criteria and their respective scores as well as their mean scores from Round 1.

Discussion

What makes a community a healthy place for its youth? What characteristics indicate that a community is a place where youth are encouraged to be physically active? These questions were the foundation on which this study was based, and the results of the Delphi provided insight into answering these ques-

Table 1. List of Indicators and Criteria in Measuring a Healthy Community

	Rd 1 Rating Mean	Rd 2 Rating Mean	Median	Std Dev
Indicator: Land Use Patterns				
Gyms for physical activity	5.36	5.83	6.0	1.11
Playgrounds for physical activity	5.45	5.67	6.0	1.77
Play fields for physical activity	5.45	5.58	6.0	1.83
Parks for physical activity	5.55	5.50	6.0	1.78
Sidewalks	5.27	5.17	5.5	1.80
Indicator: School Factors				
School-based programs for health and physical activity	5.91	6.00	6.5	1.70
Active recess during school hours	5.82	5.92	6.5	1.73
Expanded school-based physical education curriculum	5.82	5.83	7.0	1.85
Expanded school-based health education curriculum	5.82	5.83	6.5	1.80
Access to school physical activity facilities during the evening				
Parent-school involvement programs	5.45	5.08	5.0	1.73
Indicator: Home Factors				
Parents encourage physical activity	5.73	6.25	7.0	1.76
Social support from family members	5.36	6.25	6.5	0.96
Local policy to include physical education in grade school/middle	5.45	5.92	6.5	1.73
Parents are available to participate with youth	5.73	5.83	6.5	1.80
Unlimited access to television for youth	5.00	5.08	5.5	2.10
Indicator: Walking				
Park/play field within walking distance from youths' home	5.50	5.83	6.5	1.80
Walking/jogging trails	5.55	5.58	6.0	1.73
Neighborhood is safe	5.55	5.58	6.0	1.67
Bicycle paths/lanes	5.18	5.17	5.5	1.99
Adequate transportation to physical activity programs/facilities	5.36	5.08	5.0	1.73
Sidewalk continuity	5.18	5.08	5.5	1.97
Indicator: Accessibility to Facilities & Equipment				
Affordability of physical activity programs	5.45	5.70	6.0	1.33
Schools	5.64	5.58	6.0	1.73
Parks/playgrounds	5.55	5.58	6.0	1.78
Parks and recreation departments	5.90	5.50	6.0	1.83
Recreational facilities	5.82	5.50	6.0	1.73
Proximity of PA facilities/sport fields close to homes	5.45	5.42	6.0	1.78

tions. The findings of the study offered some insight relative to how school, home, and local government can encourage youth to participate more frequently in healthy physical activity.

School. School Factors was another indicator of a physically active community for youth. The results of this study clearly indicated the importance of this factor which included school based physical activity programs, active periods of recess during the school day, access to school facilities after the school day for the community residents to participate in physical activity programs, and expanded physical and health education curricula.

The *F as in Fat* report (Trust for America's Health and the Robert Wood Johnson Foundation, 2010) cited that "nationwide, less than one-third of all children ages 6-17 engage in vigorous activity, defined as at least 20 minutes of physical activity that makes the child sweat and breathe hard" (p. 6). Schools that incorporate facilities for active recess and time in their curriculum for physical education helping the students learn life-long physical activities are best positioned to contribute to a healthy community for youth. Yet, the reality is that many school districts have trimmed or eliminated these offerings from their curricula because of budget constraints or pressure to focus more upon achievement of academic standards. While the provision of physical activity as part of the elementary and secondary education curriculum has steadily declined through the years, its importance to the health and well-being of youth has become more magnified. The President's Council on Physical Fitness and Sports reported in 2010 that at best school kids receive only 24-30 minutes of recess time during the school day (Brustad, 2010). Furthermore, the Task Force on Community Preventive Services (Task Force on Community Preventive Services, 2002) made recommendations for interventions to increase physical activity, strongly urged schools to modify their curricula to increase the amount of time students spent in moderate to vigorous

activity in physical education classes. In their report, the task force stated, "school-based PE is strongly recommended because of its effectiveness in increasing physical activity and improving the physical fitness among adolescents and children" (p. 69). Unfortunately, while panelists in this study also expressed their support for the physical education curricula, "only 3.8% of elementary schools (excluding kindergarten), 7.9% of middle schools, and 2.1% of high schools provided daily physical education or its equivalent for all grades in the school for the entire school year" (Lee et al., 2007, p. 459).

The findings of this study clearly reflect the critical role the school plays in helping youth learn the importance of health and physical activity, and in collaborating with partners from the local community, such as public health agencies, park and recreation organizations, and other non-governmental agencies in helping to address health issues like obesity (OPHEA, 2010). Schools are in an excellent position to allow community organizations such as YMCAs, parks and recreation departments, youth sport organizations, and Boys and Girls Clubs access to indoor and outdoor school facilities for after school extracurricular activities promoting physical activity (OPHEA). Yet, while the importance and value of schools in providing opportunities for physical activity are evident, researchers have suggested that "although school-community linked physical activity programs offer much promise, little research has addressed the efficacy of such initiatives for increasing physical activity in children and youth" (Pate et al., 2006, p. 1219). This statement underscores the need for further research involving school-community partnerships and programs.

Home. Within the home, parents and family members play critical roles in the development of young children. Barnett (2008) noted that parents and family characteristics helped to predict participation by youth aged 10-17 years of age in a variety of extracurricular recreational

activities The emergence of Home Factors was one of the five indicators identified from the Delphi process. The criteria from Home Factors relating specifically to parents suggested that parents who encouraged their sons and daughters to engage in physical activity and who actually participated with their children in physical activities created were criteria for a positive physically active environment for youth. Parents have great influence upon their kids' perceptions of their abilities to be physically active (Brustad, 2010). This becomes critical as youth judge their degree of competence to participate and the types of physical activities they choose. Additionally, research found parents who promoted participation in physical activity were critical to their children's engagement, especially as they served as role models and provided transportation (Yousefian, Ziller, Swartz, & Hartley, 2009). Further, these researchers concluded "parents play a critical role in fostering active living in their kids" (Yousefian et al., p. 2).

Because parents play such an important role in promoting physical activity for their children, it is essential that parents maintain an objective, honest perspective of their kids' health. While the truth about youth's health and lack of physical activity may be sobering, it is the first step toward making positive changes. As an example of maintaining a realistic perspective, a 2010 report (Trust for America's Health and the Robert Wood Johnson Foundation, 2010) noted that while the majority of Americans believe childhood obesity is a problem in the U.S., an alarming percent also believed their own children were at a healthy weight, when in fact they were not!

One of the criteria of Home Factors that created a healthier physically active community was parents participating with their kids. There were only a few studies in the literature regarding parents participating with their children in physical activity. Lee and colleagues (2010), who investigated correlates of parents and their 9-13 year old children being physically active together,

concluded that participation in co-physical activity was more likely to be with boys and younger children of both genders (Lee et al., 2010) than what???They also indicated that "the likelihood of co-physical activity increased if the child was enrolled in sports" (p. 781). Furthermore Drummond, Drummond, Dollman & Abery (2010) concluded that "it is imperative to include parents within physical activity interventions where possible to enhance the prospect of successful outcomes" (p. 26).

Support from family members was another criteria emerging within the Home Factors indicator. Other researchers supported the fact that individuals from the same family tend to be similar in their physical activity preferences and levels (Seabra, Mendonça, Göring, Thomis, & Maia, 2008). Researchers also concluded that family size can be considered a predictor of children's participation in extracurricular recreational activities such as team and individual sports (Hsu & Sandford, 2007). Expanding upon the influence of family, friends' social support and involvement with family members could result in greater physical activity and energy expenditure than activities with family members only (Dunton, Liao, Intille, Wolch, & Pentz, 2011).

Local Government. Three of the five indicators and criteria gaining consensus from the Delphi panel of experts are typically found under the purview of local government. The indicators Land Use Patterns, Access to Facilities & Equipment, and Walking, and their corresponding criteria contain amenities often found in communities under the supervisor of municipal parks and recreation department that afford opportunities for PA. The indicator Land Use Patterns contained criteria that reflected an emphasis on space or facilities appropriate for physical activities. The panel believed that in order for a community to be considered a positive physically active environment for youth, gyms, playgrounds, playing fields, parks and sidewalks must exist. In order to make physical

activity attractive to youth and their parents, many communities should invest and plan for these types of amenities.

Another indicator related to this entity was Accessibility to Facilities and Equipment. The criteria listed under this indicator related to schools, parks, playgrounds, and recreation facilities. Once again, many of these facilities are made available through local government entities. Proximity of each of these facilities was a key criteria noted under this indicator. Researchers concurred by stating that “the location of schools, parks and athletic fields relative to each other and to residential areas is also very important to activity-friendliness” (Yousefian et al., 2009, p. 1). Others concluded that when multiple physical activity facilities and resources such as churches, schools, parks, recreation centers, tennis courts, and commercial recreational facilities are located within a 0.75 – 1-mile radius of a street network buffer, there was a significant increase in vigorous physical activity among high school girls (Pate et al., 2008).

Walking. The last indicator encompassed proximity issues, trails, bike paths, and a safe neighborhood environment. Typically under the supervision of local government agencies, walking and jogging trails, bike paths, bike lanes, and sidewalks are essential to providing a means by which youth and adults can be more physically active. However, the availability of accessible trails, bike lanes and sidewalks may not be enough to promote physical activity as youth and their parents must feel safe and secure in doing so (Babey, Hastert, Yu, & Brown, 2008). Appropriate lighting, sight lines, and inviting spaces do much to encourage pedestrians, cyclists, and others engaged in physical activity (Steinman et al., 2010).

Future Research

In order to further validate the instrument developed in this study for quantifying

how healthy the community is in providing physical activity for youth, a nominal group technique process could be implemented to assign weights to factors/variables that are critical to making a particular decision. One such technique is the Multi-Attribute Utility Theory (MAUT), a decision making process used widely in education, health care, business and policy making. The application of a MAUT to the findings of this study would be appropriate to determine the utility of a given approach to improving practices, interventions, or strategies for integrating physical activity into the community.

The development of this initial design and validation of an objective and evidenced-based instrument measuring indicators and criteria of a physically active healthy community can serve as a basis for further studies of physical activity in various communities and settings. For example, the process and findings from this study could be replicated in both a “Healthy Campus” community and a “Healthy Destination” community.

Conclusion

Community-based partnerships and collaborative efforts “designed to improve the broader social, physical, and built environment of local residents could be a strategy for tackling the growing epidemic of childhood obesity” (Singh et al., 2010b, p. 511). Local community park and recreation professionals among others can play an important role in developing these relationships. However, for communities to be effective in promoting healthy physical activity for youth, trans-disciplinary collaboration and partnerships in a community are needed (Henderson & Bialeschki, 2005). Alliances among the fields of parks and recreation, education, urban planning, public health, transportation, and other disciplines working toward a common goal of providing healthy, physically active communities for youth will be

essential. Understanding how physical activity can be facilitated and promoted among youth will have a significant impact on providing and sustaining healthy communities for the future.

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