Slater et al., J Child Adolesc Behav 2013, 1:2
DOI: 10.4172/2375-4494.1000108

Journal of Child & Adolescent Behavior

Research Article Open Access

How Well Do Adolescents Know Their Local Parks? Test-Retest Reliability and Validity of an Adolescent Self-Report Park Survey for Diverse Low-Income Urban Neighborhoods

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Abstract

Background: The study aimed to develop a self-report park survey tailored to underserved populations at risk of obesity (low income urban youth), and to determine the feasibility and reliability of collecting park measures from memory.

Methods: Sixth through 8th grade students were recruited from two purposively selected urban schools (one predominantly African American and the other predominantly Latino with high proportions of lower-income students). A total of 103 (47 male) students participated in the test-retest reliability of the survey. Research staff conducted field audits of neighborhood parks/physical activity settings (N=21) to determine concurrent validity of the self-report surveys.

Results: Overall, youth participants had good reliability on two-thirds of the survey measures. Validity results suggest students had poor percent agreement on the majority of park/physical activity setting features. Although both schools had similar overall validity results, the only common validated feature was playgrounds.

Conclusions: Results suggest most measures were understood by participants, but overall youth could not validly report what physical activity features are accessible to them from memory. This suggests that if youth do not know the features that exist in their neighborhood, then they are probably not utilizing them for physical activity.

Keywords: Adolescent; Physical activity; Youth risk

Background

Physical inactivity is an ongoing public health concern due to its association with overweight/obesity and numerous chronic diseases [1]. The downward trend in physical activity rates across age is particularly disconcerting. 48% of boys and 35% of girls (aged 6-11) obtain the recommended 60 minutes of daily physical activity, while only 12% of boys and just over 3% of girls (aged 12-15) obtain 60 minutes of daily physical activity with this decline continuing into adulthood [2]. This decline in physical activity across gender and age may be explained, in part by less sports participation and lack of access to recreation facilities. Results from the Youth Risk Behavior surveys show younger students are more likely to participate in sports [3]. Additionally, Caucasian students and higher income youth are more likely to participate in sports than are African American, Latino [3,4], or low-income students [5]. Cost has been cited as a key barrier to sports participation by low-income youth [6,7]. Absence of recreation facilities, such as parks, playgrounds, and school-based physical activities, has been associated with lower rates of physical activity [8].

A possible solution to these disparities across sports participation is to encourage greater use of parks and provide more free or reduced-cost park-based informal or formal recreational sports programs. However, little is known about what specific features within parks and other physical activity settings are currently most utilized by youth. Moreover, we know little about the frequency of park use or the combination of features that promote physical activity behavior in parks [9].

To date, the evidence has not been conclusive regarding adolescent park utilization. For example, Chomitz et al. [10] found that different neighborhood settings were associated with varying levels of physical activity in middle school youth. Specifically, neighborhood parks and walking/bike paths were associated with moderate intensity physical activity and playing fields, courts and recreational centers were associated with vigorous intensity physical activity. They also found that utilization of neighborhood parks and recreational centers was associated with meeting the national recommendation of 60 minutes of daily physical activity. However, there is some evidence that adolescents utilize parks less frequently than either children or adults [11,12], and that the park features that attract children and adults do not necessarily appeal to adolescents [11,13]. Further evidence shows that park renovations have no effect on adolescent park use and physical activity, even if they result in increased activity in adults and younger children [14]. Given that physical activity positively influences body weight, it is particularly important to determine what physical activity-related features could affect adolescent physical activity participation.

The gold standard method for collecting information on physical

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Received May 07, 2013; **Accepted** July 12, 2013; **Published** July 15, 2013

Citation: Slater S, Full K, Fitzgibbon M, Floyd MF (2013) How Well Do Adolescents Know Their Local Parks? Test-Retest Reliability and Validity of an Adolescent Self-Report Park Survey for Diverse Low-Income Urban Neighborhoods. J Child Adolesc Behav 1: 108. doi:10.4172/2375-4494.1000108

activity settings has typically been on-site data collection [15]. However, this method is both labor and resource intensive, and may restrict the sample size for a study. Therefore, this study aimed to develop a cost-effective and efficient method for collecting reliable measures of park and other physical activity settings characteristics. We also sought to evaluate the feasibility and reliability of collecting these measures with low-income, African American and Latino youth.

Methods

Survey development

Two schools (1 predominantly African American and 1 predominantly Latino), with high percentages of students eligible to receive free or reduced-meals (indicator for low socioeconomic status) and located in a large urban metropolitan area, were purposively selected to participate in the study. Both schools were classified as neighborhood schools, where the overwhelming majority of students lived in walking distance to the school. Neighborhood schools are defined as those that have an attendance boundary where all students living within this boundary are eligible to attend that particular school. On average, attendance boundaries encompass all housing located within a three-quarter mile buffer surrounding the school.

Neighborhoods surrounding the schools had varying types of available physical activity settings (Table 1). Adolescents in 6th through 8th grade were selected as the target study population. Adolescent participants ranged in age from 11 to 15 years old. This age range was selected as the target population because they are typically old enough to have the freedom to visit neighborhood locations without adult supervision/escort, but too young to have a driver's license.

Focus groups were first conducted to guide the development of the self-report park/physical activity characteristics survey. The focus groups identified where adolescents are physically active and what features of these settings are important for their physical activity. Results of the focus groups are described in detail elsewhere [16]. Briefly, we found that the location, lack of adult supervision, availability of sports and physical activity-related features and programs and safety issues all play a role in influencing adolescent physical activity. Focus group results also suggested that male adolescents were more knowledgeable about features, and may be better suited to complete self-report surveys than female adolescents. In general, male participants were much more aware of programs and facilities available to them in their neighborhoods. Finally, focus group results revealed that there is an unequal distribution of physical activity resources available across low income neighborhoods; with some neighborhoods having a fair number and others lacking in resources [16].

Drawing on the focus group results, the self-report park/physical activity characteristics survey asked youth to provide information on the two park/physical activity settings they visit most often. The survey includes questions on: 1) student demographics; 2) student physical activity; 3) identification of the two physical activity settings youth visit most often; 4) frequency and length of stay for visits; 5) primary reasons for visiting these settings; 6) presence and condition of sports and physical activity-related features; 7) presence and condition of amenities; 8) provision and cost of programs; 9) presence of physical disorder; and 10) safety-related issues at or near these settings. Youth were asked to provide information on park/physical activity setting features using the following response categories: 1) not at this place; 2) good or okay condition; 3) poor or bad condition; and 4) don't know. For the program-related and physical disorder measures youth were asked to provide yes/no responses on presence. Finally for the safety-related questions, using a two-item response, youth were asked whether they agreed/disagreed with the measures, e.g., "I feel safe here".

The survey contained a total of 49 questions. Sixteen, or one-third, of the questions asked for demographic information and self-reported physical activity-related measures. Participants completed the survey in about 15 minutes (range 5 to 40 minutes). For the purposes of this paper, we present results for the 33 park/physical activity setting measures to test our assumption that adolescents can reliably provide information about the parks and physical activity settings that they regularly frequent.

Participant recruitment and survey administration

Active parental/legal guardian consent was required for this study, and all study procedures were approved by the Institutional Review Board at the University of Illinois at Chicago. Recruitment efforts began in October 2010 with project staff attending school report card pick up day; posting flyers in the schools; giving brief presentations about the study in classrooms; and sending study materials and consent forms home with students. A total of 121 students were recruited (86 or 29%) students from the predominantly Latino school and 35 (23%) were recruited from the predominantly African American school. Recruited youth were asked to complete the self report park/physical activity characteristics survey twice at school during free time. No incentives were provided for participation in the survey. The test-retest survey occurred one week apart in School 1 and two weeks apart in School 2, due to an unexpected school closing. A total of 103 students across the two schools completed both waves of the survey (Table 2 for a breakdown of student characteristics).

Park audits

Park audits were conducted by trained study staff using the Bridging the Gap (BTG)– Park and Physical Activity Facility Observation

	School 1	School 2
School type	**Neighborhood_**	**Neighborhood_**
Total 6th, 7th and 8th grade students at school	~ 150	~ 300
Race/Ethnicity	99.2% Black	95.7% Hispanic
Mobility	29.3%	12.0%
% Low income students	99.8%	94.7%
Attendance rate	92.7%	95.4%
Students recruited	35 (23%)	86 (29%)
Completed test-retest surveys	25 (71%)	78 (91%)
Parks	4	2
Physical activity settings	8	3
Nearby schools with accessible PA features	2	2

Table 1: School characteristics.

School	School 1[a]	School 2[b]
Male	11 (48%)	36 (46%)
Female	12 (52%)	42 (54%)
Total:	23[c]	78
Breakdown by Grade		
6th Graders	9 (39%)	18 (23%)
7th Graders	7 (30.5%)	20 (26%)
8th Graders	7 (30.5%)	40 (51%)

[a]Student participants were African American
[b]Student participants were Latino
[c]Some student demographic data missing (N=2)

Table 2: Student characteristics.

Forms. The tools were designed to capture the presence and condition of sports and physical activity-related features, presence and condition of amenities, street accessibility to the park/physical activity setting, characteristics, and prevalence of incivilities in physical activity settings across the country. The BTG Park Observation Form is intended for use in public local/municipal or county parks, while the BTG Physical Activity Facility Observation Form was developed for use in a variety of indoor and outdoor physical activity (PA) facilities, specifically non-profit locations, such as community municipal recreation centers, YMCAs, Boys & Girls Clubs, Jewish Community Centers, public schools, and also for-profit gyms and health clubs.

Statistical analyses

Study data were collected and managed using REDCap electronic data capture tools hosted at the University of Illinois at Chicago [17]. REDCap (Research Electronic Data Capture) is a secure, web-based application designed to support data capture for research studies, providing: 1) an intuitive interface for validated data entry; 2) audit trails for tracking data manipulation and export procedures; 3) automated export procedures for seamless data downloads to common statistical packages; and 4) procedures for importing data from external sources [17].

Using SAS version 9.2, inter-rater reliability was assessed by calculating the Cohen's kappa statistic for all variables. Landis and Koch's [18] guidelines were used to interpret the reliability results, where: 0.81 to 1.00 represents almost perfect agreement; 0.61 to 0.80 represents substantial agreement; 0.41 to 0.60 represents moderate agreement; 0.21 to 0.40 represents fair agreement; 0.00 to 0.20 represents slight agreement; and <0.00 represents poor agreement. We also calculated overall percent agreement (the proportion of cases grouped within the same response category for test and retest) to help interpret those dichotomous measures that were skewed towards yes/true or no/false. Youth self-reported park measures were validated by calculating the percent agreement between student responses and objectively audited park observations that were conducted by trained study staff. Measures that showed agreement equal to or above 70% were considered reliable [19].

Results

On average, youth participants visited the park/physical activity settings they reported on about once a week (Range: less than once a month to every day), and stayed for approximately 2 hours (Range: less than an hour to 3+hours). The three primary reasons they provided for visiting the settings were: 1) to hang out and talk with friends or family (73%); 2) to play (53%); and 3) to play sports (51%). About 28% of respondents did not participate in organized team sports or physical activity programming. Respondents who were involved in some type of organized physical activity participated 1.8 days (range: 0-5) a week.

Reliability results for the full sample are shown in Table 3. Table 4 shows reliability results separate for each school; reliability was also

Measures	Kappa/ICC	Total % Agreement	Validity %
Presence of playground equipment	NA	0.86	92%
Presence of baseball diamond	0.53	0.71	44%
Presence of open grassy area	0.33	0.84	55%
Presence of tennis courts	0.48	0.74	52%
Presence of volleyball courts	0.37	0.63	38%
Presence of basketball courts	0.41	0.66	72%
Presence of soccer fields	0.56	0.81	68%
Presence of paths or trails	0.45	0.71	28%
Presence of skate park	0.37	0.67	60%
Presence of football fields	0.37	0.66	44%
Presence of water playground	0.46	0.74	53%
Presence of indoor gymnasium	0.54	0.73	48%
Presence of swimming pool	0.38	0.80	67%
Presence of lake or pond	0.35	0.76	73%
Presence of restrooms	0.68	0.86	83%
Presence of drinking fountains	0.59	0.82	87%
Presence of shelter	0.47	0.73	20%
Presence of picnic facilities	0.39	0.67	58%
Presence of parking lot	0.56	0.88	68%
Presence of bike racks	0.41	0.63	31%
Availability of classes	0.47	0.70	40%
Availability of camp/afterschool program	0.42	0.66	57%
Presence of program costs	0.34	0.68	34%
Presence of sufficient lighting at night	0.51	0.78	74%
Presence of broken glass	0.39	0.76	62%
Presence of graffiti	0.62	0.81	51%
Presence of litter	0.47	0.73	40%
Respondent feels safe here	0.59	0.84	__
Respondent feels safe accessing park	0.62	0.84	__
Presence of mean/threatening people	0.49	0.82	__
Presence of gang members at park	0.68	0.86	__
Presence of gang members in area	0.60	0.80	__
More parents or adults needed here	0.60	0.81	__
Respondent gets bullied or teased here	0.49	0.92	__

[a]Kappa not calculated because there was no variation in the responses

Table 3: Inter-rater reliability of park/physical activity setting survey and validity full sample (N=103).

Measures	School 1			School 2		
	Kappa/ICC	Total % agreement	Validity %	Kappa/ICC	Total % agreement	Validity %
Sample size	N=25			N=78		
Park/Physical activity setting use and contents						
Presence of playground equipment	0.04	0.75	78%	NA[a]	0.90	86%
Presence of baseball diamond	0.59	0.73	33%	0.51	0.69	54%
Presence of open grassy area	0.30	0.63	47%	0.26	0.88	62%
Presence of tennis courts	0.49	0.71	33%	0.48	0.74	53%
Presence of volleyball courts	0.57	0.73	19%	0.31	0.61	57%
Presence of basketball courts	0.15	0.71	83%	0.41	0.65	60%
Presence of soccer fields	0.48	0.69	53%	0.41	0.84	75%
Presence of paths or trails	0.47	0.69	22%	0.44	0.72	29%
Presence of skate park	0.36	0.63	50%	0.37	0.69	70%
Presence of football fields	0.42	0.69	50%	0.35	0.66	38%
Presence of water playground	NA[a]	0.75	53%	0.43	0.73	52%
Presence of indoor gymnasium	0.49	0.73	36%	0.55	0.73	58%
Presence of swimming pool	0.55	0.73	31%	NA[a]	0.81	95%
Presence of lake or pond	0.34	0.63	61%	0.33	0.79	85%
Presence of restrooms	NA[a]	0.88	70%	0.67	0.86	47%
Presence of drinking fountains	NA[a]	0.81	58%	0.60	0.82	64%
Presence of shelter	0.57	0.75	17%	0.44	0.72	24%
Presence of picnic facilities	0.43	0.63	56%	0.34	0.69	61%
Presence of parking lot	0.66	0.81	50%	0.39	0.89	78%
Presence of bike racks	0.26	0.50	28%	0.44	0.66	31%
Availability of classes	0.60	0.77	50%	0.40	0.68	30%
Availability of camp/ afterschool program	0.43	0.67	61%	0.41	0.65	53%
Presence of program costs	0.39	0.69	33%	0.32	0.68	34%
Presence of sufficient lighting at night	0.16	0.65	92%	0.58	0.81	56%
Presence of broken glass	0.54	0.81	70%	0.36	0.75	55%
Presence of graffiti	0.61	0.81	58%	0.61	0.81	44%
Presence of litter	0.44	0.73	28%	0.46	0.73	54%
Respondent feels safe here	0.55	0.82	—	0.59	0.84	—
Respondent feels safe accessing park	0.56	0.82	—	0.63	0.84	—
Presence of mean/threatening people	0.36	0.76	—	0.52	0.84	—
Presence of gang members at park	0.82	0.94	—	0.66	0.84	—
Presence of gang members in area	0.51	0.75	—	0.63	0.81	—
More parents or adults needed here	0.50	0.75	—	0.63	0.83	—
Respondent gets bullied or teased here	0.60	0.88	—	0.41	0.93	—

[a]Kappa not calculated because there was no variation in the responses

Table 4: School 1 vs. School 2 inter-rater reliability and validity.

examined by gender, but results were similar for males and females, thus they are not presented. Results for the full sample show that no items had almost perfect agreement, and only four items (restrooms, graffiti, safe access to the park, and presence of gang members at the park) had substantial agreement. The remaining 29 items had either moderate or fair agreement. However, in terms of percent agreement, 26 items had 70% or higher. Results for School 1 showed one item (presence of gang members at the park) received almost perfect agreement. Two items (graffiti and parking lot) had substantial agreement. Twenty-five items had either moderate or fair agreement. Lighting, playgrounds and basketball courts all had slight agreement. Students from School 2 had no items with almost perfect agreement, but 6 items had substantial agreement. The remaining 26 items had moderate or fair agreement, and two items had no kappa calculated due to low variation. Finally, Schools 1 and 2 had 23 and 24 items with 70% or higher agreement, respectively.

Park/PA setting validation

Although there were 21 parks, schools, and physical activity facilities available across the two neighborhoods, the student participants primarily reported on a total of 6 locations (School 1: 1 park, 1 school, 1 nonprofit facility; and School 2: 2 parks and 1 school), thus, the validation results presented here only include these 6 locations. Validation was possible on 27 (79%) of the 34 survey items. Validation was not possible on the 7 subjective safety-related questions. For the full sample, a total of 6 (22%) items showed good validity, with the greatest percentage for presence of playground equipment. School specific validation results showed School 1 and 2 had good validity on 5 and 6 items, respectively. For School 1, having sufficient lighting showed highest agreement (92%); for School 2, presence of swimming pools showed highest agreement (95%).

Discussion

The purpose of this study was to determine if adolescents from specific vulnerable populations could reliably and validly provide information on the parks and physical activity settings they regularly frequent. The results of these self-report surveys could then be used to identify which park features and programs are associated with

increased adolescent physical activity to help inform the development of new neighborhood physical activity settings and programs. Results showed that, although adolescents could reliably complete the self-reported park/physical activity characteristics survey on approximately two-thirds of the measures, validity testing showed responses were only accurate for a handful of measures. Although both schools had similar overall validity results, the only common validated feature was playgrounds. Based on the features with good validity, and the types of activities youth discussed during the survey development focus groups [16], adolescent respondents appear to be able to only validly recall the presence and condition of the park/physical activity settings they utilize most often. For those features they do not utilize frequently, adolescents were less likely to accurately recall presence and condition. In general, most of the features adolescents could accurately report were not sports or physical activity-related features, suggesting that these adolescents are not visiting parks in order to be physically active. This information alone is important considering these settings are the most convenient and accessible locations for these youth to be physically active [16]. If local parks and other physical activity settings are to be effective at increasing adolescent physical activity, which in turn, can help reduce the prevalence of overweight and obesity in underserved adolescent populations [20], it is critical to understand which combination of design features or programs have the greatest positive influence on adolescent physical activity behavior.

Local stakeholders, such as community government officials, park and recreation departments, park advisory councils, and nonprofit organizations (e.g., YMCAs or sports clubs) could use the survey to determine how adolescents currently utilize local parks to help modify current or develop future programs or events that would target the most widely used park features. Results of the survey could also inform stakeholders of which features are under-utilized. They could then modify these features or better promote them to be specifically used for physical activities tailored to adolescent populations.

Although adolescents had low validity on the self-report survey, reliability results suggest most park-related measures were understood by the survey participants. However, results suggest some measures, such as paths/trails and park shelters may have been misinterpreted by youth respondents. For example, adolescents appear to have interpreted any walkways between park features as paths or trails. However, this measure was designed to capture the presence of a feature that would be used specifically to walk, bike or roller skate as an activity rather than as a means of getting from one feature to the next. These measures should be better defined on a revised future survey. In accordance with the study protocols, adolescent participants received no instructions, guidance or description of the survey measures. Thus, more research is warranted to explore whether, with some training and direction, rather than completing the survey from memory, adolescents could also use the instrument while visiting the parks/physical activity settings and complete the survey on-site. This methodology would involve a community-based participatory approach to data collection and could be used to inform local stakeholders of the lack of, or poor condition of certain park features and help advocate for park improvements. This change in the methodology would be an alternative use of the survey, and also allow youth to be more integrally involved in the research process and contribute firsthand to the development of strategies that would be implemented to affect their physical activity behavior [21,22].

Consistent with results from the survey development focus groups [16], reliability and validity testing showed no significant differences across race/ethnicity. However, inconsistent with the focus groups, which suggested that male adolescents were more familiar with the local park/physical activity setting features, we found no gender differences in the reliability and validity testing of the self-report survey (results not presented).

Survey test-retest results also showed high reliability for all the perceived safety-related questions. Although there was no comparable objective measures to validate youths' responses to these measures, youth raised neighborhood safety issues repeatedly during the survey development focus groups [16], suggesting they are very aware of gang activity and other related issues in their neighborhoods. There is emerging evidence showing neighborhood crime and perceptions of personal safety influence park use [13,23,24]. Use of these measures and the development of additional safety-related and neighborhood accessibility measures (e.g. pedestrian safety to and from the park/physical activity settings), could help provide additional information on what safety-related factors may prevent or limit park use in diverse neighborhoods.

Results of the study also showed that the tool can be used to capture detailed information from a range of settings (e.g., parks, nonprofit facilities, schools), as well as which neighborhood settings may be under-utilized, or what settings/features within settings encourage greater utilization/visitation by adolescents. The two neighborhoods targeted for this study had a disproportionate number of available parks/physical activity settings. However, survey responses revealed the majority of participating youth from both schools utilized approximately three settings per neighborhood. School 1 and 2 students reported visiting the largest park in their respective neighborhoods, which also both provide many sports programs. School 1 students also reported visiting a local nonprofit facility, where many of the students attended an after school program. A review by Beets et al. [25] provides evidence showing that after school programs can be effective interventions for increasing youth physical activity levels. Given that youth participants selected the location of their after school program as a physical activity venue, it would be useful to develop additional measures that would better capture information related to physical activity practices during after school programs.

Students from School 2 reported visiting the only other park identified in their neighborhood. Students from both schools reported on frequently visiting their own school grounds. As previously stated, both schools are integrated into the neighborhoods from which they draw their students. This integration facilitates the use of the schools' outdoor facilities for leisure physical activity and play by both students and other neighborhood residents. Based on focus group results, the schools also provide a safe, convenient place to play that is free of gang members and gang-related activity, regardless of how many other neighborhood settings are accessible to youth. This frequent use of school grounds by all participating adolescents suggests that this tool could be used to provide utilization information related to joint/shared use agreements with communities and school districts.

Study Limitations and Conclusions

This study is subject to several limitations. First, the study involved only two neighborhoods located in the same metropolitan area. However, the targeted neighborhoods were selected to ensure the inclusion of differing park/physical activity setting resources, and race and ethnicity to enable examination of variations across sites. Second, it is possible that youth visited the settings they reported in between surveys and changed some of their responses between the test retest based on personal visits. However, the high reliability results, coupled

with the corresponding low validity results, which were calculated using the retest survey responses, makes this unlikely. Finally, of the 21 parks/physical activity settings identified across the two neighborhoods, reliability and validity testing was conducted using data collected from only six locations because participating youth utilized just a handful of places in their neighborhoods.

Although the validity results of the survey were unexpectedly low in comparison to the good reliability results, this type of data collection method is still a promising alternative. Overall, results suggest that the self-report survey is a useful data collection method to employ with adolescents. More research is needed to test the survey across different populations, a larger sample of parks/physical activity settings and communities across the country. A modified protocol, where adolescents could be asked to complete the survey instrument, while visiting the park rather than completing the survey by memory at some other location, should also be tested in future research. This modified protocol could be supplemented with other data collection methods, such as photo voice or ecological momentary assessment to capture a wider range of data on park characteristics and physical activity behavior in these settings. The survey, with its current protocol, can also be used to determine adolescents' knowledge of their neighborhood physical activity environments. Results of the survey could help inform local stakeholders on how to better promote existing programs, develop new ones based on the park features most utilized by adolescents, or address barriers that prevent adolescents from frequenting certain settings.

Funding Source

Funding for this research was provided by The Robert Wood Johnson Foundation (RWJF) Active Living Research Program (Grant #67119).

References

1. Health and Human Services Department (2000) Healthy People 2010: With understanding and improving health and objectives for improving health. Washington DC, USA.
2. Troiano RP, Berrigan D, Dodd KW, Mâsse LC, Tilert T, et al. (2008) Physical activity in the United States measured by accelerometer. Med Sci Sports Exerc 40: 181-188.
3. Taliaferro LA, Rienzo BA, Donovan KA (2010) Relationships between youth sport participation and selected health risk behaviors from 1999 to 2007. J Sch Health 80: 399-410.
4. Johnston LD, Delva J, O'Malley PM (2007) Sports participation and physical education in American secondary schools: current levels and racial/ethnic and socioeconomic disparities. Am J Prev Med 33: S195-208.
5. Mandic S, Bengoechea EG, Stevens E, de la Barra SL, Skidmore P (2012) Getting kids active by participating in sport and doing it more often: focusing on what matters. Int J Behav Nutr Phys Act 9: 86.
6. Brockman R, Jago R, Fox KR, Thompson JL, Cartwright K, et al. (2009) "Get off the sofa and go and play": family and socioeconomic influences on the physical activity of 10-11 year old children. BMC Public Health 9: 253.
7. Humbert ML, Chad KE, Spink KS, Muhajarine N, Anderson KD, et al. (2006) Factors that influence physical activity participation among high- and low-SES youth. Qual Health Res 16: 467-483.
8. Gordon-Larsen P, Nelson MC, Page P, Popkin BM (2006) Inequality in the built environment underlies key health disparities in physical activity and obesity. Pediatrics 117: 417-424.
9. Floyd MF, Bocarro JN, Smith WR, Baran PK, Moore RC, et al. (2011) Park-based physical activity among children and adolescents. Am J Prev Med 41: 258-265.
10. Chomitz VR, Aske DB, McDonald J, Cabral H, Hacker KA (2011) The role of recreational spaces in meeting physical activity recommendations among middle school students. J Phys Act Health 8: S8-S16.
11. Shores KA, West ST (2008) The relationship between built park environments and physical activity in four park locations. J Public Health Manag Pract 14: e9-e16.
12. Cohen DA, McKenzie TL, Sehgal A, Williamson S, Golinelli D, et al. (2007) Contribution of public parks to physical activity. Am J Public Health 97: 509-514.
13. Baran PK, Smith WR, Moore RC, Floyd MF, Bocarro JN, et al. (2013) Park use among youth and adults: Examination of individual, social, and urban form factors. Environment and Behavior.
14. Tester J, Baker R (2009) Making the playfields even: Evaluating the impact of an environmental intervention on park use and physical activity. Prev Med 48: 316-320.
15. Brodersen NH, Steptoe A, Williamson S, Wardle J (2005) Sociodemographic, developmental, environmental, and psychological correlates of physical activity and sedentary behavior at age 11 to 12. Ann Behav Med 29: 2-11.
16. Slater S, Fitzgibbon M, Floyd M (2013) Urban adolescents' perceptions of their neighborhood physical activity environments. Leisure Sciences 35: 167-183.
17. Harris PA, Taylor R, Thielke R, Payne J, Gonzalez N, et al. (2009) Research electronic data capture (REDCap)--A metadata-driven methodology and workflow process for providing translational research informatics support. J Biomed Inform 42: 377-381.
18. Landis JR, Koch GG (1977) The measurement of observer agreement for categorical data. Biometrics 33: 159-174.
19. Fleiss JL (1981) Statistical methods for rates and proportions. (2nd Edn), John Wiley & Sons, New York, USA.
20. Ogden CL, Carroll MD, Kit BK, Flegal KM (2012) Prevalence of obesity and trends in body mass index among US children and adolescents, 1999-2010. JAMA 307: 483-490.
21. Floyd MF (2012) Contributions of the community stakeholder park audit tool. Am J Prev Med 42: 332-333.
22. Kaczynski AT, Stanis SA, Besenyi GM (2012) Development and testing of a community stakeholder park audit tool. Am J Prev Med 42: 242-249.
23. Stodolska M, Acevedo JC, Shinew KJ (2009) Gangs of Chicago: Perceptions of crime and its effects on the recreation of Latino residents in urban communities. Leisure Sciences 31: 466-482.
24. Weiss CC, Purciel M, Bader M, Quinn JW, Lovasi G, et al. (2011) Reconsidering access: Park facilities and neighborhood disamenities in New York City. J Urban Health 88: 297-310.
25. Beets MW, Beighle A, Erwin HE, Huberty JL (2009) After-school program impact on physical activity and fitness: a meta-analysis. Am J Prev Med 36: 527-537.