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Racism and Health

Legacies of Environmental Injustice on Neighborhood Violence, Poverty and Active Living in an African American Community

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Features of the built environment such as parks and open spaces contribute to increased physical activity in populations, while living in neighborhoods with high poverty, racial/ethnic segregation, presence of neighborhood problems, and violence has been associated with less active living. Our present study examined the factors that may facilitate or hinder the long-term success of built environment interventions aimed at promoting physical activity in communities with a legacy of environmental injustice. The data for this study came from a larger assessment of the impact of a new local park in Newark, NJ. Analysis included all adults from the original study population who self-identified as African American/Black (N=95).

To provide an in-depth understanding of how neighborhood social and physical features influence physical activity among African Americans living in high poverty neighborhoods, we analyzed data from two focus groups with a total of 14 participants, and six in-depth interviews held in 2009-2010.

Survey results indicated high exposure to violence, and associations between neighborhood features and walking. Self-reported neighborhood walkability was associated with increased walking (P=.01), while increased perception of neighborhood safety was associated with less walking (P=.01). Qualitative results indicated that residents perceived the new park as a positive change, but also expressed concern about the presence of violence and lack of social cohesion among neighbors, with younger generations expressing less optimism than the elderly. Positive changes associated with improvements to the built environment may be limited by social conditions such as neighborhood violence.

Introduction

Physical inactivity is a public health challenge worldwide,[1] and promotion of physical activity (PA) has become a major public health priority.[2] Approximately 35% of adults in the United States do not meet physical activity recommendations of engaging in at least 150 minutes of moderate or 75 minutes of vigorous physical activity or a combination of the two per week.[3,4] Individuals who are physically inactive are at a higher risk of developing type 2 diabetes mellitus, heart disease, hypertension, certain cancers, and premature mortality.[5,6] The obesity epidemic has also highlighted the importance of promoting physical activity in African Americans, who often are disproportionately affected by obesity and physical inactivity.[7,8]

Built environment features such as the walkability of areas, access to recreational facilities, and the availability of parks/open spaces have been found to contribute to increased physical activity in populations,[9,10] while neighborhood poverty, racial segregation, and neighborhood problems and exposure to violence have been associated with less physical activity.[9,11,12] Thus, the history of environmental racism in the United States is important to consider as communities of color have been disproportionately excluded from access to green spaces, and when these amenities do exist, they are often present in the context of racial/ethnic segregation, poverty, or violence.[13]

The present study is a secondary analysis of quantitative and qualitative data exploring how the opening of a local park and the social and physical features of the surrounding neighborhood influenced walking behaviors among African American adults living in a highly segregated urban center.

These mixed findings suggest that policies and initiatives aimed at improving the built environment should address poverty, safety, and social cohesion to ensure more active living communities. *Ethn Dis*. 2021:31(3):425-432; doi:10.18865/ed.31.3.425

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Our objective was to gain insights on the factors that may facilitate or hinder the long-term success of built environment interventions aimed at promoting physical activity in communities with a legacy of environmental racism.

Materials and Methods

Study Setting

In the 1970s, activists in the central ward of Newark, New Jersey demanded the allocation of park space in their community. As a result, Nat Turner Park, named after a 19th century slave rebellion, was opened in June 2009 and is currently the largest city-owned park in Newark. The park serves as a recreation for a neighborhood of 19,000 people including 7,000 children.[14] It includes a 400-meter regulation track, a playground, a seating area, a multiuse area, walking paths, park benches, trash receptacles, metal entrance arches, lawn area, and more than 200 trees. The park was part of the Parks for People Program, a national initiative to increase green spaces in urban areas.

Study Design

We used a cross-sectional mixed methods explanatory sequential design in which the quantitative data are collected first followed by qualitative data collection. The purpose of this approach is to use the qualitative results to further explain and interpret the findings from the quantitative phase.[15] The qualitative data are used to explain patterns that may be contradictory to the study or broader research literature. After both sets of data are collected and analyzed, the findings are integrated and interpreted.

Quantitative Study Design

Study Population

The data utilized in the present analysis were part of the Newark Community Survey (2009),[16] a pilot study designed to assess the health impact of the opening of Nat Turner Park. Briefly, a household survey was conducted involving a random sample of households located within a 1-mile radius of the newly developed neighborhood park. Households with at least one child aged ≤18 years were eligible to participate (N=118). Our analysis included all adults from the original study population who self-identified as African American or Black (n=95).

Quantitative Measures

Participants in the community survey were asked to report on a series of questions regarding neighborhood attributes, health, and sociodemographic characteristics. Walking, our study outcome, was assessed by asking participants about the number of days during the previous seven-day period in which they walked for at least 10 minutes at a time and time spent walking using an internationally validated questionnaire.[17] Data on frequency and time were used to calculate metabolic equivalents (MET),[17] a measure assessing energy expended and presented as MET-mins.

Perceived neighborhood attributes were assessed using questions shown to have moderate-to-strong internal consistency in previously published literature.[18] Neighborhood domains were measured on a 5-point Likert scale and included safety (4 items), walking environment (6 items) social cohesion (6 Items), and violence (9 items, measured on a 4-point Likert scale). Social cohesion and collective efficacy were based on established measures assessing closeness, helpfulness, trust, and control of neighborhood problems among neighbors.[19,20] Socioeconomic measures included education (less than high school, high school graduate, some college/technical school, and college or more), employment status (employed, unemployed), and car ownership (yes or no). Other covariates included age (continuous), sex at birth, overall self-rated health (excellent/very good vs good/fair/poor), and self-reported asthma.

Qualitative Study Design

Study Population

This research project was conducted in neighborhoods that are highly impoverished and located in a racially/ethnically segregated area of Newark, NJ. With support from local community activists, a purposeful sample of study participants was recruited in 2009-2010 from the same neighborhoods in which the quantitative survey was administered. Data for the current study included two focus groups with a total of 14 participants and 6 in-depth interviews to explore narratives around social cohesion, neighborhood attributes, park use, walking and physical activity. Eligible study participants identified themselves as primary caregivers (parents or grandparents, male or female) of at least one child aged ≥18 years and as Black or African American. The focus group and in-depth interviews were convened in a community setting near participants' residences and facilitated by a team

of trained qualitative researchers. All focus groups and interviews were audiotaped and transcribed verbatim.

Qualitative Measures

Both the focus group and all interviews utilized a semi-structured interview guide that asked study participants to identify and describe the community in which they lived, explain how they had arrived in the neighborhood, how it had changed over time, how often they engaged in outdoor physical activity during both warm and cool months and describe their use of local parks. Participants were also asked to report on the frequency and type of their physical activity and their perceptions of walking as a form of exercise. Finally, to assess social ties, they were asked to discuss the nature and frequency of their contact with neighbors.

Analysis

We described population characteristics from the community survey using mean and standard deviation for continuous variables, percentages for categorical variables, and correlations between neighborhood attributes. We fit log-transformed metabolic equivalents of walking per week since it did not exhibit a normal distribution in our sample and convert to geometric means to ease interpretation. For the linear regression models, we kept safety, walking environment and social cohesion as separate main predictors to avoid overlap across all constructs. Models 1-3 include each predictor additionally adjusted for age, sex, asthma, car ownership, education, and employment status. Model 4 adjusts for all neighborhood predictors simultaneously, plus the covariates. Statistical significance was defined at α=.05 and all statistical analyses were done in SAS version 9.4.

Qualitative analyses were undertaken through an iterative sequence of coding and synthesizing. We created an initial coding template after multiple readings of the data. The team then met over several months to reread the transcripts and refine the code book, using a template style of analysis.[21] The coding template was then applied to focus group and interview transcripts, refining them and identifying patterns that emerged. These patterns were then grouped into themes and triangulated to contextualize the survey results.[22] This study was approved by the institutional review board at University of North Carolina at Greensboro.

Results

Quantitative Results

Table 1 shows that the mean age of the respondents was 36.9 years (SD=12.2) and 84% of the study participants were women. Approximately half of the participants (47.6%) earned <$8,000/ year, and only 32% of participants were currently employed. Adults who only completed a high school education represented 35.5% of study participants. Self-rated health was deemed excellent or very good by 43% of participants and asthma was reported among 29% of respondents.

Tables 2 and 3 show the association between neighborhood measures and walking. Table 2 indicates a significant positive correlation between the scores for perceived walking environment and social cohesion (r=.39) and safety (r=.43), but a negative correlation between walking environment and perceived violence (r=-.25). Table 3 exhibits the results of our unadjusted and adjusted models to assess the association of various neighborhood and built environment characteristics and the mean log-MET of walking per week. Models 1 through 3 indicate that the independent effects of perceptions of safety, walking environment, and social cohesion are not significantly associated with walking behavior. In Model 4, however, where both safety and walking environment are simultaneously adjusted for, results for safety and walking environment were statistically significant. For each one unit increase in perceived neighborhood safety, on average (geometric mean), walking decreased by 11.8% (P=.01), while each unit increase in the walking environment was associated with increased walking (8.7% geometric mean; P=.03).

Qualitative Results

Qualitative analysis of focus group and in-depth interview data revealed five major themes around physical activity for adults: 1) Neighborhood Change; 2) Community Violence; 3) Adult and Family Exercise; 4) Park Activities; and 5) Social Cohesion. Each of these five themes was subdivided into more specific subthemes (Table 4). The mean age of participants in the focus group was 41.6 years and 39 years for the in-depth interviews; one-third or less were married and approximately 20% or less had less than a high school education. All participants self-identified as African American or Black.

Table 1. Sample characteristics of adult African American participants, Newark Community Survey, 2009

Characteristic	African Americans, N=95
Log_e(MET-week walking), mean (SD)	6.1 (1.3)
Neighborhood perception, mean (SD)	
Safety scale, range 4-17	9.6 (3.1)
Social cohesion scale, range 6-30	16.8 (4.7)
Violence scale, range 9-36	20.2 (6.7)
Walking environment scale, range 7-30	19.2 (4.7)
Age, years, mean (SD)	36.9 (12.2)
Sex, female, % (n) [a]	83.7 (78)
Employed, yes, % (n)[a]	32.3 (30)
Annual family income, 2008, % (n)[a]	
< $8,000	47.6 (39)
$8,000-$11,999	12.2 (10)
$12,000-$15,999	14.6 (12)
≥$16,000 or more	25.6 (21)
Educational attainment, % (n) [a]	
< high school	18.3 (17)
High school graduate	35.5 (33)
Some college or higher	46.2 (43)
Marital status, % (n) [a]	
Single	76.6 (72)
Married	17.0 (16)
Divorced or widowed	6.4 (6)
Car ownership, yes, % (n) [a]	34.1 (31)
Self-rated health, % (n) [a]	
Excellent or very good	42.6 (40)
Good	30.9 (29)
Fair or poor	26.6 (25)
Asthma, yes, % (n) [a]	28.7 (27)

a Sample sizes may differ due to missing data in some covariates.

Neighborhood Change

Two of the three interviewees and multiple focus group participants noted that their neighborhoods had improved over recent years. Greater safety, improved housing, new buildings, cleaner grounds, and renovated parks were all mentioned as positive improvements. However, most participants noted that more police were still needed, as well as better control of illegal drugs. A generational split appeared within this category, with older, long-time residents (mostly grandparents) emphasizing these improvements:

"I've been there for twenty, twenty-five years, and I've seen some, some stuff go on in that neighborhood. For now, I see, it done come up. They've really changed it. I mean they got security 24 hours….they're keeping the grounds clean, they've done a lot of changes."

Other residents reiterated the impact of these positive changes:

"What do I call this area where I live? I can call it safe, I would say it's safe, a safe area. I would say, ah man, one time it wasn't. But the last couple, like, five years…it came along. It's been safe now."

Younger, newer residents were more critical. They did not articulate the same confidence:

"They can say upcoming all they want. But to me, it's still the ghetto. It's coming up, and they're trying to clean it up with the drugs and everything all around, there's people getting shot and everything else, but it's going down a little bit…I don't care what kind of label people put on it, it's still ghetto."

Another younger resident stated:

"…[they] built parks and all the recreation homes, centers, but in reality, it really didn't change...people still getting robbed, they still getting killed, they still getting jumped."

In the context of this discussion, participants agreed that the opening of the park would allow more people to be outdoors, but more park security was needed, as well as better control of illegal drugs.

Community Violence

Both the older and younger generation acknowledged that violence was a problem in their neighborhoods. Parents worried about the impact of violence on the community's children:

"A little girl was out in the park playing, they had a shootout, she got caught in the middle of [this], she's paralyzed. Four years old, she's paralyzed for the rest of her life because of two idiots."

Some addressed this reality by keeping their children inside or within eyesight much of the time. Others accompanied them outside to play or

go to the park. Parents also reported other dangers: robberies, gangs, drug trafficking and overt sexual activity. Another remained watchful during trips around the neighborhood:

"…in the wintertime, you got your nice coat on, your boots. They pull up on the side of you in the car, and tell you take it off. What you gonna do? You want your life or your boots or your jacket?"

Adult and Family Exercise and Park Activities

Residents reported a broad range of family-related outdoor physical activities. They noted that during warmer months, their children took bike rides, jumped rope, went skateboarding, and played basketball, soccer, volleyball, and football, often in a local park. Some parents ran with their teenage or infant children (with the latter tucked into strollers). Walking was the most frequently reported and most highly favored adult activity, especially early morning walking in the park during warm months. Running or jogging was the second most popularly reported category of adult physical activity.

Participants described parks as important for family and community social gatherings, and as an accessible place for families and neighbors to meet:

"[The park is] a place where we can all meet up…so our community can be more of a meeting ground that's not so far and out of reach of everybody." "We have a very large beautiful park they just did. And I think everybody, you know, in the community appreciates it, even outside... You have a variety of sports out there going on, football, soccer, jogging, track and field. The kids enjoy it, because I have my 10-year-old granddaughter…and she loves it."

Because of the value of these resources, residents wanted to ensure universal, safe access to them and wondered why some parks are safe and others are not:

"*For the county park, they have park police for the park. We need that here, too, you know…there's people out there early in the morning, and they're out there walking. There's kids out there playing football, soccer clinic."*

Social Cohesion

Older residents who had grown up in the same neighborhood repeatedly affirmed their sense of belonging and commitment to the neighborhood despite the threat of violence:

"So, yes, there are bad things that are happening in Newark but there are also good things that are happening in Newark and, and this is my commu-

Table 2. Spearman correlation among perceived neighborhood attributes, Newark Community Survey, 2009.

	Safety	Social cohesion	Violence	Walking environment
Safety scale	1.0	.39 [a]	-.48 [a]	.43 [a]
Social cohesion scale	--	1.0	-.43 [a]	.39 [a]
Violence scale	--	--	1.0	-.25 [b]
Walking environment scale	--	--	--	1.0

a P≤.0001.
b P<.05.

Table 3. Linear regression models of the association between neighborhood attributes and MET walking/ week, Newark Community Survey, 2009

Neighborhood Attribute	Bivariate	Model 1[b]	Model 2[b]	Model 3[b]	Model 4[b]
	β (95% CI), GM[a]	β (95% CI), GM[a]	β (95% CI), GM[a]	β (95% CI), GM[a]	β (95% CI), GM[a]
Safety scale	-.05 (-.13, .02), -5.0%	-.05(-.15, .01),-6.3%			-.10(-.20, -.03),-11.8%[c]
Walking environment scale	.04 (-.01, .09), 3.8%		.03 (-.02, .09), 3.0%		.08 (.02, .15), 8.7%[c]
Social cohesion scale	-.009 (-.07, .05), -.6%			-.01 (-.07, .05),-1.4%	-0.02 (-0.07, 0.06), -1.6%

a. GM, geometric mean, calculated as (eβ-1)*100%.
b. Adjusted for age, sex, asthma, car ownership, education, and employment status.
c. Statistically significant, P<.05.

nity. I call it my community, you know, this is my home…this is where I was brought up at, you know what I'm saying, and just using the term 'ghetto' to me…I just don't like to use that term."

Finally, a few residents described the need for greater community unity, like that seen in nearby cities, to bring in better local neighborhood resources:

"We can go to city hall, we can go to all of this, we can…make it known what we want, but we have to progress as a group and go down there. As parents, as friends.... mothers and stuff, we have to go down there, it's not going to come to us. And if we want these things for our kids, we have to find them."

Table 4. Qualitative themes and subthemes, Newark Community Survey, 2009

Major Themes	Associated Subthemes
Neighborhood change	Improvements and positive change
	Change for the worse
Community violence	Shootouts
	Other dangers (drugs, robberies, gangs)
Adult and family exercise	What people do/prefer
	Gendered exercise
	Exercise definitions and meaning
	Exercising with children
Park activities	What people do in the park
	Park activities promoting social cohesion
	More park security needed
	Adult exercise in the park
	Impact of park/physical activity on child health
	Taking children and grandchildren to the park
Social cohesion	Strong commitment to the neighborhood
	Better resources/resource management needed
	Neighbors don't help with children anymore
	Difficult neighborhood relationships
	More community participation needed

Discussion

Our study utilized a mixed-methods approach to explore how changes to the built environment in an impoverished, segregated neighborhood influenced physical activity in a sample of African American adults. Qualitative results revealed that residents generally welcomed the opening of a park. However, community members also reported direct experiences with violence that acted as deterrents to the use of this new neighborhood resource. The deterioration of the neighborhood appeared to influence the community's sense of the long-term benefits of the park, including intergenerational differences. In quantitative analyses, self-reported measures of neighborhood safety and neighborhood walking environment were differentially associated with walking: increasing walkability was associated with increased walking, while increased perception of safety was associated with less walking.

Mixed methods study designs are essential in expanding our understanding of complex social problems[23] as they use an integrative strategy suitable for most study designs.[24] Findings from our study support broader calls to redress racial/ethnic and socioeconomic inequalities in access to parks and open spaces[25,26] and provides a first-hand account on what increasing access to parks means to residents of poor communities. For example, community residents generally welcomed the opening of the neighborhood park and perceived this action as a broader sign of progress and hope for the community. However, the positive aspects of the park opening were hampered by concerns about the lack of safety in the neighborhood. Residents shared vivid and tragic examples of violent events that had taken place, prompting some study participants to be skeptical of the long-term benefits of the new park. The extent to which Newark's efforts will result in reductions in violence comparable to efforts in other cities[27] remains to be examined.

Our findings suggested that physical activity policies or interventions aimed at increasing access to open spaces must involve comprehensive, multi-pronged approaches that recognize the realities of the local social context to ensure their long-term success. In the study by Branas and colleagues,[27] the authors concluded that qualitative data would aid future research in exploring how and why greening of urban spaces decreases violence and improves health. Our study was a first step toward this effort and supports the limited research on this topic.[28-30]

The qualitative component of the study allowed us to explore potential solutions to the continued use of the

park. Several respondents suggested increased policing of parks as a potential approach for promoting safety. However, this approach would require buy-in from local police districts since parks may not be a designated area of patrol. It also requires community participation in defining the level and form of policing desired. Today's Black Lives Matter movement has shed national tension on the disproportionate number of African Americans killed by police officers and the increased mistrust in African American communities. Improving community relations and establishing trust between residents and police offers is a vitally important next step, which could include police and community patrols.

Our apparently mixed findings regarding the neighborhood walking environment and walking behaviors have at least three possible explanations. First, prior research has suggested that "positive" features of the neighborhood such as walkability-related characteristics may not uniformly enhance health.[31,32] For example, Lovasi and colleagues[32] have concluded that vulnerable populations may need additional forms of support to obtain the health benefits that result from positive neighborhood characteristics. Second, the qualitative data revealed important differences in how older and younger generations respond to neighborhood change and these subpopulation differences may explain the apparent contradictions we observed. Han and colleagues (2017) found that while adults were significantly less likely to use parks after crimes younger people remained unaffected.[33] Third, although walking was the most frequently reported adult activity, participants in our focus groups discussed participation in other types of outdoor physical activity. These activities included riding bikes, skateboarding and outdoor sports. Our quantitative measures did not specifically include these types of activities and therefore we cannot assess how perception of community safety impacts engagement in other activities beyond walking. In sum, future studies are needed to corroborate our findings and determine if neighborhood features differ across generational status and PA measure.

Study Limitations

Some limitations in our study warrant attention. As an exploratory study, additional research using larger samples and longitudinal study designs are needed to strengthen causal inferences regarding the built environment on physical activity. Our quantitative analyses relied on self-reported measures of neighborhood attributes and thus measurement error is likely. Nonetheless, the reliability of self-reported neighborhood characteristics has been previously documented[24] and other work has shown that both perceived and objective neighborhood measures showed similar associations.[31] Also, we only examined the role of neighborhood features on walking for transportation and this relationship may differ for leisure-time physical activity. Lastly, the number of participants in our study was small and we limited this sample to African Americans living in specific neighborhood contexts, thereby potentially limiting the generalizability of our study findings.

Conclusion

In summary, our use of a mixed-method study design provided a more nuanced understanding of both benefits and potential barriers to increasing open spaces in impoverished neighborhoods. Findings suggest that interventions geared toward promoting more active living should consider how these initiatives intersect with issues of environmental injustice, neighborhood violence, and other social determinants that can place limits on physical activity.

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Conflict of Interest

No conflicts of interest to report.

Author Contributions

Research concept and design: Payton Foh, Echeverria; Acquisition of data: Echeverria; Data analysis and interpretation: Payton Foh, Brown, Denzongpa, Echeverria; Manuscript draft: Payton Foh, Denzongpa, Echeverria; Statistical expertise: Echeverria, Brown; Acquisition of funding: Echeverria; Administrative: Payton Foh, Echeverria; Supervision: Payton Foh, Echeverria

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