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Original article

Perceived and Police-Reported Neighborhood Crime: Linkages to Adolescent Activity Behaviors and Weight Status

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A B S T R A C T

Purpose: Inadequate physical activity and obesity during adolescence are areas of public health concern. Questions exist about the role of neighborhoods in the etiology of these problems. This research addressed the relationships of perceived and objective reports of neighborhood crime to adolescent physical activity, screen media use, and body mass index (BMI).
Methods: Socioeconomically and racially/ethnically diverse adolescents (N = 2,455, 53.4% female) from 20 urban, public middle and high schools in Minneapolis/St. Paul, Minnesota responded to a classroom survey in the Eating and Activity in Teens 2010 study. BMI was measured by research staff. Participants' mean age was 14.6 (standard deviation = 2.0); 82.7% represented racial/ethnic groups other than non-Hispanic white. Linear regressions examined associations between crime perceived by adolescents and crime reported to police and the outcomes of interest (BMI *z*-scores, physical activity, and screen time). Models were stratified by gender and adjusted for age, race/ethnicity, socioeconomic status, and school.
Results: BMI was positively associated with perceived crime among girls and boys and with reported crime in girls. For girls, there was an association between higher perceived crime and increased screen time; for boys, between higher reported property crime and reduced physical activity. Perceived crime was associated with reported crime, both property and personal, in both genders.
Conclusions: Few prior studies of adolescents have studied the association between both perceived and reported crime and BMI. Community-based programs for youth should consider addressing adolescents' safety concerns along with other perceived barriers to physical activity. Interventions targeting actual crime rates are also important.

IMPLICATIONS AND CONTRIBUTION

Addressing the relationships of both perceived and objective reports of neighborhood crime with adolescent physical activity, screen media use, and obesity, higher BMI among girls and boys was positively associated with crime. Perceived crime was directly associated with reported crime, both property and personal, in this diverse sample.

Does crime limit physical activity in urban, ethnically diverse, low-income adolescents? Which is more important in predicting physical activity, sedentary behavior, and Body Mass Index (BMI)—perceived crime, measured via survey, or crime reported to police? The present study, conducted among adolescents in

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Minnesota, examined relationships between perceived crime; reported person and property crime rates; and physical activity, screen media use, and BMI.

Foster and Giles-Corti [1] provide a thorough review of the literature on crime, physical activity, and BMI, demonstrating that studies examining associations between crime and physical activity among adults have had mixed results (also [2,3]). Associations were stronger in some studies for vulnerable groups such as women and older adults; Diez Roux and Mair [3] suggest that more recent studies show stronger associations.

Among children and adolescents, most studies have focused on either perceived crime or reported crime but not both [4,5]. Studies that did examine this relationship in adolescents have, in general, found mixed associations between perceived lack of safety, reported crime, and physical activity in adolescents. Associations with physical activity were stronger among girls, however.

Gomez et al. [6] examined 177 seventh graders in San Antonio, mostly Mexican Americans. Girls' outdoor physical activity was negatively associated with both perceived crime and reported violent crime. Ries et al. [7] studied 329 Baltimore high-school students. Neither objectively measured nor perceived crime was associated with park use or physical activity. Rossen et al. [8] studied 365 Baltimore children aged 8–13 years. High levels of audited neighborhood incivilities led to higher levels of perceived crime. However, those living on blocks with above median incivilities were far more likely to walk to school. Kneeshaw-Price et al. [9] explored physical activity in 145 6- to 11-year-old children in San Diego, finding correlations among field observed incivilities, parents' perceptions of crime, and prior crime victimization. Police-reported crime was the only crime measure (negatively) associated with physical activity. In a study of a larger population, Janssen [10], using data from a Canadian national sample of 14,125 youth aged 11–15 years, found youth were less likely to be active outside school for at least 4 hours a week in areas with higher perceived crime and higher reported crime against persons.

There have been fewer studies that have also examined BMI and both perceived and reported crime. Studies of perceived or reported crime and sedentary behaviors have mixed findings—some finding associations [11] but others not [12,13]. Carroll-Scott et al. [14] examined reported and perceived crime in relation to BMI, physical activity, sedentary behavior (screen time), and healthy eating in a sample of fifth-grade and sixth-grade students (N = 1,048). Property crimes were associated with higher BMI but not other outcomes. Larson et al. [15] conducted a comprehensive analysis of social and environmental constructs and obesity in adolescents, using the same data set as is used in the present study, and found that girls who perceived a lack of safety in their neighborhoods had higher BMIs; however, a dichotomized measure of neighborhood crime (reported to the police) showed no association with physical activity or BMI in the study sample (also [16]). The present study builds on this previous work by examining the role of crime in more detail. Specifically, more measures of crime are included; associations with both perceived and reported crimes are examined more fully; and both physical and sedentary activities are examined, in addition to BMI, as outcomes.

The multifaceted assessment undertaken in the present study was designed to help clarify the association of crime to BMI among adolescents, including the role of physical activity and sedentary behavior. We hypothesized in this study that perceived crime would be associated with adolescent obesity, reduced physical activity, and higher screen time, whereas associations with reported crime would be weaker. Reported or actual crime does affect perceptions, so do media representations, perceptions of incivilities (e.g. graffiti), and individual attitudes [17,18]. We thus further hypothesized that because of the complex causal pathways linking reported and perceived crime [17], they would not be strongly associated with each other.

Methods

Locations and process

Data were collected in Eating and Activity in Teens 2010, a population-based study examining dietary intake, physical activity, weight control behaviors, weight status, and factors associated with these outcomes [15,16]. The study included adolescents from 20 public middle schools and high schools in the Minneapolis/St. Paul metropolitan area of Minnesota, in socioeconomically and racially/ethnically diverse communities. In all, 2,715 adolescents completed anthropometric measures and classroom surveys, including measures of perceived neighborhood safety, during the 2009–2010 academic year; of these, 2,455 lived in neighborhoods within the Minneapolis and St. Paul city limits for which we had data on reported crime (personal and property) and answered questions about perceived crime, constituting the final sample [19,20].

Trained research staff administered surveys during two class periods of 45–50 minutes each. The survey was first pilot tested with a different sample of 129 middle-school and high-school students to examine the test–retest reliability of measures over a 1-week period. All study procedures were approved by the University of Minnesota's Institutional Review Board and by participating school districts. Adolescents were given the opportunity to assent only if their parent/guardian did not return a signed consent form indicating their refusal to have their child participate [19,20].

Among adolescents who were at school on the days of survey administration, 96.3% had parental consent and chose to participate (N = 2,793); this total group was demographically similar to the 2,455 students for which we had crime data and anthropometric measures. Mean participant age was 14.6 years (standard deviation [*SD*] = 2.0); 42.8% were in middle school (sixth–eighth grades), and 57.2% were in high school (ninth–12th grades). Participants were equally divided by gender (53.4% girls). Racial/ethnic backgrounds were 17.3% white, 29.5% African-American or black, 21.0% Asian American, 17.0% Hispanic, 3.5% Native American, and 11.6% mixed or other. Of participants, 45.2% were on public assistance, 74.3% reported that they qualified for free or reduced lunch, 39.0% had at least one parent who graduated college, resulting in 62.3% being identified as low or low–medium socioeconomic status (SES).

Research staff measured adolescents' height and weight in a private area at each school. Height was assessed to the nearest .1 cm using a Shorr Board and weight to the nearest .1 kg using a calibrated scale. BMI was calculated and converted to *z*-scores, standardized for gender and age.

Neighborhood environment assessment

A Geographic Information System was used to assess crime reported to police. We obtained Uniform Crime Report crime