

Urban Community Characteristics and Adolescent Assault Victims

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ABSTRACT

Purpose: To examine the relationship between neighborhood factors and adolescent victimization for low- and high-risk areas of Milwaukee, Wis.

Methods: In this cross-sectional study, we compared neighborhood characteristics based on the US Census Database by rates of adolescent victim rates as measured through victim client enrollment in an adolescent violence intervention program. Multiple regression procedures were used to analyze the data.

Results: The mean adolescent assault victim rate was 34.31 per 10,000 population (Standard deviation [SD] =29.71) with range from 0.00 to 105.09 per 10,000 population in 35 ZIP-code areas in Milwaukee County. Neighborhood ZIP codes with low median household income and high rates of grandparents serving as heads of household were associated with high rates of adolescent assault victims. ($R^2=0.75$)

Conclusions: Urban areas with higher rates of grandparent head of household and low median household income are associated with higher rates of adolescent assault victims.

BACKGROUND

Medical, public health, and legal professionals as well as policymakers are aware of the effects of personal and environmental factors on adolescent victims of interpersonal violence. Consequently, injury literature enumerates victimization risk and protective factors;¹ some compare societal, familial and individual influences to each other.² However, there is limited discussion con-

cerning the neighborhood characteristics that may contribute to youth victimization.³ Social ecological theory implies that the community characteristics will affect the psychosocial development of youth. For example, youth who live in a neighborhood with lower rates of high school graduation may be themselves less likely to graduate from high school. The purpose of this study is to examine the neighborhood factors that may contribute to youth victimization by comparing low- and high-risk areas of Milwaukee, Wis for youth victimization. This study's unique focus then is the neighborhood characteristics from which the victims come, not those of the victims themselves.

METHODS

This is a cross-sectional study conducted utilizing victim ZIP codes from the Project Ujima database. Project Ujima is an injury prevention/intervention program sponsored by Children's Hospital of Wisconsin, the Medical College of Wisconsin, and Children's Service Society of Wisconsin for youth victims of assault who are 7-18 years old and who were admitted to the Emergency Department and Trauma Center at Children's Hospital of Wisconsin in Milwaukee. The database includes information on these patients ($n=1089$) between 1997 and 2002 from 35 ZIP code areas of Milwaukee City. ZIP code and type of injury were acquired upon registration at the emergency department; injuries were verified as being intentional by Project Ujima staff members. Due to missing ZIP code information, 17% of records were excluded. The study protocol was approved by the Institutional Review Board of the Medical College of Wisconsin as an expedited study.

We selected the following variables as the neighborhood characteristics for all 35 Milwaukee County ZIP Codes from the 2000 United States Census database:⁴ percentage of single parent family, percentage of no high school diploma over age 18, percentage of unemployed over age 16, percentage of grandparents as a caregiver, population density per square mile, size

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of family, lived in house less than 5 years, and median household income. The main outcome was the adolescent assault victim rate defined as the number of assault victims (aged 12-18 years) divided by the number of population aged 18 years or younger multiple 10,000, in each ZIP code area.

Neighborhood characteristics are expressed as mean. Spearman correlation coefficients of the adolescent assault victim rates with each neighborhood characteristic were calculated. Using multiple regression analysis, a forward-backward stepwise selection procedure was applied to determine significant variables of neighborhood characteristics in relation with the adolescent assault victim rates. Statistical significance was set at $P < 0.05$ (2 tails). All analyses used SAS statistical software (SAS version 8, SAS Institute Inc., Cary, NC, USA).

RESULTS

The mean, standard deviation, minimum and maximum of adolescent assault victim rate and neighborhood characteristics are shown in Table 1. The mean adolescent assault victim rate was 34.31 per 10,000 population (SD=29.71) with range from 0.00 to 105.09 per 10,000 population in 35 ZIP code areas in Milwaukee County.

Table 2 shows the Spearman correlation coefficients of adolescent assault victim rates with neighborhood characteristics. All neighborhood characteristics, except for "lived in house less than 5 years," were significantly correlated with adolescent assault victim rates ($P < 0.01$ or 0.001). Except for "median household income," which shows negative correlation with victim rate, all other variables show a positive correlation. Variables of the percent of households headed by grandparents responsible for their grandchildren under age 18, percent of single parent family, and median household income (US dollars) were most correlated with assault victim rates ($r > 0.75$). However, when all variables were entered into a multiple regression model with adolescent assault victim rates as a dependent variable, only percent of households headed by grandparents and median household income were selected by the stepwise procedure. As a ZIP code increased in the percentage of households headed by grandparents, it increased the presence of adolescent assault victims in that ZIP code (parameter estimate [β]=12.03, standard error [SE]=1.97, $P < 0.0001$), whereas increase of median household income decreases the adolescent assault victim rate ($\beta = -0.00064$, SE=0.00021, $P = 0.0045$). The coefficient of determination (R^2) for this regression equation is 0.75.

DISCUSSION

This report indicates that the households headed by

grandparents responsible for their grandchildren under age 18 and median household income were the significant neighborhood predictor variables of adolescent assault victims in 35 ZIP code areas in Milwaukee County. Our results may have important implications for high-risk area identification, public policy development, and city resources administrations. Developing resources for grandparents who are parenting their grandchildren through community-based agencies may be 1 strategy. Providing technical education, job training, and access to jobs for youth and their families so that they may increase their household income may be another strategy to address violence in these communities.

Literature indicates that grandparents become guardians to minor grandchildren largely because of biological parent neglect/abuse, abandonment, prison sentence, mental illness, substance abuse, teen mother or death.^{5,6} Furthermore, stress tools, like the Parenting Stress Index⁷ have identified full-time grandparenting life stress to be greater than parenting stress. Having an increased number of grandparents as head of households in a neighborhood is even more likely than single parent families to be among the most accurate indicators of family instability.⁵ Family instability in a neighborhood in our study may be one of the most important reasons for increased adolescent assault victims in that neighborhood.

The relationship between neighborhood socioeconomic disadvantage and the incidence of intentional adolescent injury is replete in current journals. Low-income neighborhoods, along with the low education and low employment that often follows, have been established predictors of individual frustration and violence, regardless of the actual *victim's* household income.³ One study suggests that compared with children living in areas with few low-income households, children in areas with predominantly low-income households were 4.5 times as likely to receive assault injuries.³ That we did not detect a significant correlation between victim rates and other variables such as percent of no high school diploma over age 18 and unemployed over age 16 may be related to the inter-correlation with median household income or percent of grandparents head of household, or both.

There are several limitations to this study. First, we were unable to use census tract data, rather than ZIP code information, due to the small numbers of victims in each census tract. Second, we did not have ZIP code information for some victims of interpersonal violence. In particular, those who were severely injured and thus unable to give ZIP code information or those who were homeless would have been excluded from this analysis.

Table 1. Mean, Standard Deviation (SD), Minimum and Maximum of Adolescent Assault Victim Rate and Neighborhood Characteristics of 35 ZIP-Code Areas in Milwaukee County, Wis

Assault Victim Rate and Neighborhood Characteristics	Mean	SD	Minimum	Maximum
Assault victim rate (1/10,000)*	34.31	29.71	0.00	105.09
Grandparent (%)†	1.47	1.59	0.00	6.00
Single parent family (%)	11.98	8.74	1.30	30.20
Median household income (US \$)	41,277	15,093	13,140	84,200
No high school diploma over age 18 (%)	19.27	13.47	3.30	57.40
Unemployed over age 16 (%)	40.45	10.91	15.70	68.80
Size of family	3.08	0.35	2.24	4.00
Population density‡	5429.00	3406.00	787.20	13001.00
Lived in house less than 5 years (%)	50.44	11.38	38.10	81.30

*Assault victim rate defined as the numbers of adolescent assault victim (aged 12-18 years) divided by the number of population aged 18 years or younger multiple 10,000, in each ZIP code area.

†Grandparent (%) is the percentage of household in which grandparents are caregivers for grandchildren.

‡Population density is the number of person per square mile

Table 2. The Spearman Correlation Coefficients of Adolescent Assault Victim Rate with the Characteristics of 35 ZIP-Code Areas in Milwaukee County, Wis

Characteristics	Correlation Coefficients
Grandparent (%)§	0.81‡
Single parent family (%)	0.77‡
Median household income	- 0.77‡
No high school diploma >age 18 (%)	0.74†
Unemployed over age 16 (%)	0.71‡
Size of family	0.60‡
Population density	0.57‡
Lived in house <5 years (%)	0.19

*P<0.05

†P<0.01

‡P<0.001

§Grandparent (%) is the percentage of household in which grandparents are caregivers for grandchildren.

||Population density is the number of person per square mile.

neighborhood characteristics at the ZIP code level in relation to adolescent assault victims. These characteristics may also be pertinent to the prevention of youth violence in these neighborhoods. Community and government leaders need to direct resources to neighborhoods with high numbers of grandparents as head of household, single parent households, low incomes, large families, and poor educational levels. Resources including job training, accessible jobs, mental health counseling for stressed families, and support for grandparents who are parenting their grandchildren may be pertinent in diminishing violence in these communities. In particular, grandparents who are guardians for their grandchildren need societal support and resources in this endeavor.

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Third, only those youth assault victims requiring emergency treatment were included; victims sustaining injuries for which they did not seek care would not have been included. Fourth, the information obtained from census data for each ZIP code area may not be accurate for the entire span of years for Project Ujima assault victims. Finally, the cross-sectional relationships between predictors (neighborhood characteristics) and victim rates limit us to infer causality in this study.

While the neighborhoods of adolescent assault victims cannot be evaluated completely independent of the victims themselves, this study sheds light on the community environment in which victimization occurs. A future study direction would be to focus on the census tracts within a high adolescent assault ZIP code area to determine if this study's found correlations and distribution of predictor variables holds at the census tract level.

In conclusion, our study indicates the importance of

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