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Brief communication

Racial and ethnic differences in associations of community violence with self-harm: a population-based case–control study

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Introduction

Self-harm is a leading cause of deaths and injuries in the United States, and rates are increasing for reasons that are not fully understood. Community violence is one feature of the social environment that may contribute to self-harm risk and variation in risk across populations. Exposure to community violence is associated with greater risk of substance use [1,2], psychological symptoms [3–8], social isolation [9], and norms permissive of violence [10,11], which are all strong risk factors for self-harm [10–21].

Prior research documents associations between community violence and self-harm [22–30], but this association may also vary by race or ethnicity. Previous epidemiologic research documents substantial differences in rates of self-harm and self-harm risk factors such as substance use by race or ethnicity [31,32]. Moreover, Blacks, American Indians, and Hispanics are disproportionately exposed to community violence [33,34] and thus may disproportionately experience the health consequences of such exposure. To our knowledge, no studies have examined whether community violence differentially affects racial–ethnic groups with respect to self-harm. This study seeks to fill this gap.

Materials and methods

The methods follow those of a study of community violence and both fatal and nonfatal self-harm in a general population [29]. Briefly, we conducted a population-based, density-sampled case–control study of all Californians [35,36]. Cases were all deaths and hospital visits due to deliberate self-harm in statewide death and hospital discharge records, 2006–2013. Controls were sampled from California resident participants of the American Community Survey [29,37]. Exposure to community violence was defined as the average past-year rate of death due to homicide and injury due to assault in the community of residence. We defined five non-Hispanic race groups (White, Black, American Indian, Asian, and Multiracial) and one Hispanic group of any race.

We estimated the association of community violence with self-harm using two rate difference parameters designed to avoid extrapolation beyond the observed data: (1) an overall rate

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Table 1
Adjusted associations of past-year community violence with fatal and nonfatal self-harm for overall rate difference and population attributable rate difference parameters by race–ethnicity

Race/ethnicity	Fatal self-harm		Nonfatal self-harm	
	Overall rate difference (95% CI)	Population attributable rate difference (95% CI)	Overall rate difference (95% CI)	Population attributable rate difference (95% CI)
White	5 (1, 10)	2 (0, 4)*	90 (87, 93)	45 (44, 46)
Black	76 (−7, 158)	3 (−3, 8)	88 (81, 95)	44 (40, 47)
American Indian	†	†	74 (50, 97)	56 (46, 66)
Asian	−2 (−4, 1)	−1 (−3, 0)	2 (−1, 4)	2 (1, 3)
Multiracial	−62 (−238, 113)	−67 (−238, 104)	65 (57, 74)	25 (21, 29)
Hispanic	0 (−1, 1)	0 (0, 1)	23 (21, 25)	12 (11, 13)

White: White race, non-Hispanic ethnicity. Black: Black or African American race, non-Hispanic ethnicity. American Indian: American Indian or Alaska Native race, non-Hispanic ethnicity. Asian: Asian or Pacific Islander race, non-Hispanic ethnicity. Multiracial: multiple and other races, non-Hispanic ethnicity. Hispanic: any race, Hispanic ethnicity. Rate differences are annualized and reported per 100,000; CI = confidence interval.

* Confidence interval includes 0.

† Estimates were unstable and are not reported.

difference, contrasting self-harm rate if individuals were exposed to the highest versus the lowest violence levels observed within each of their communities [38]; (2) a population attributable rate difference contrasting the observed self-harm rate to that if individuals were exposed to the lowest violence levels observed within each of their communities. When stratified by race or ethnicity, the first parameter captures differential responsiveness to community violence (given the range among the individuals in each covariate group), whereas the second reflects differential extent of exposure to community violence.

We weighted all analyses to be population representative [39] and estimated marginal, additive-scale associations [38]. We used generalized additive models [40] to flexibly model the rate of fatal or nonfatal self-harm in each racial–ethnic group and to adjust for individual- and community-level confounders (Appendix), with the nonparametric bootstrap for confidence intervals [38].

Ethical review was conducted by the State of California and University of California, Berkeley Committees for the Protection of Human Subjects. See Appendix for additional methodological details.

Results

We identified 27,027 self-harm fatalities and 331,203 nonfatal self-harm injuries resulting in hospital visits, 2006–2013. Appendix Table 2 presents sample sizes and descriptive statistics on self-harm and community violence exposure by race or ethnicity. Fatal self-harm rates were highest among American Indians and Whites; nonfatal self-harm rates were highest among Blacks, Whites, and American Indians. Community violence exposure was generally highest for Blacks and American Indians. Cases experienced greater violence exposure than controls.

Table 1 presents the adjusted associations of past-year community violence with fatal and nonfatal self-harm. Although community violence was generally associated with greater self-harm, there were substantial differences in estimates across racial–ethnic groups. For fatal self-harm, both the overall rate difference and population attributable rate difference were substantially larger for Blacks than any other racial–ethnic group. In contrast, associations for Asians, Hispanics, and Multiracial individuals were null or slightly negative, and estimates for American Indians were unstable and are not reported.

For nonfatal self-harm, estimates were largest and nearly identical for Blacks and Whites. The overall rate difference was smaller for American Indians than Blacks and Whites, but the population attributable rate difference was larger, reflecting their greater exposure to community violence. Associations for Asians, Hispanics, and Multiracial individuals were positive but substantially smaller than for Blacks or Whites.

Conclusions

We identified large, positive associations of exposure to community violence with self-harm that varied substantially by racial–ethnic group. These differences highlight the importance of considering heterogeneity in the effects of neighborhood exposures, and in particular risk factors for self-harm, that may be masked by overall population estimates.

The reasons for differences in associations across racial–ethnic groups will require more research. Large associations for Blacks may imply that the psychological experience of community violence or the mechanisms are different for this group. Historical and intergenerational experiences of violence and trauma [41,42] and the interaction between police activity and community violence in predominantly black communities [43] merit further investigation. For American Indians, similar explanations [44] as well as the greater prevalence of mental and substance use disorders [45] should be explored. Smaller associations for Hispanics and Asians may reflect the lower rates of self-harm, lower prevalence of self-harm risk factors, or the protective effects of ethnic enclaves (e.g., Hispanic paradox [46]).

This study had several limitations. First, although we controlled for numerous confounders, confounding control was limited by the covariates available in the data. However, we improve on previous studies using objective rather than self-reported measures, both fatal and nonfatal outcomes, parameters that do not rely on extrapolation, and a large, diverse sample, which allowed examination of understudied racial–ethnic minority populations. Second, we used distinct data sources for cases and controls, and measurement of covariates may differ across sources. Third, death and hospital visit data are imperfect and do not capture violent events not resulting in death or serious injury. Race–ethnicity may be misclassified, particularly for certain races–ethnicities in hospital data, but this misclassification is expected to be nondifferential [47–49], and any resulting bias is expected to be toward the null. Fourth, we did not account for repeated hospital visits by the same individuals [50]; thus, standard errors may be underestimated. Finally, there is substantial heterogeneity within racial–ethnic groups; future studies would benefit from further disaggregation.

Community violence is an important, understudied, and potentially modifiable [51–54] feature of the social environment that disproportionately affects poor, racially, and ethnically

segregated urban neighborhoods [34,55,56]. This study enhances our understanding of the contextual factors driving self-harm and builds on a growing body of literature documenting the health consequences and health equity concerns of exposure to community violence and the potential benefits of investing in violence prevention.

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Supplementary data

Supplementary data associated with this article can be found in the online version at https://doi.org/10.1016/j.annepidem.2019.04.004.

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