

Identifying Youth at Risk for Injury or Violence: Any Association by Race or Sex?

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Abstract

Unintentional injury and violence are important public health topics for youth. This study aimed to discover prevalence of risk for injury and violence and explore statistically significant differences by sex and race. Hypothesis is males are at higher risk for injury and violence and minority populations are also at higher risk for unintentional injury and violence. Quantitative analysis was performed to determine any association of injury or violence with race or sex. The Youth Risk Behavior Survey data includes questions regarding unintentional injury and violence: Differences by sex and race were analyzed for unintentional injury and violence among youth. Significantly more females reported being electronically bullied compared to males. There was a difference between females and males in youth reporting they were ever physically forced to have sexual intercourse. Females were more likely than males to report they did not go to school because they felt unsafe at school or on their way to or from school. Nearly 40% of all youth reported not always wearing a seat belt when riding in a car driven by someone else. Black youth reported statistically significant higher percentage than all other races in not always wearing a seat belt when riding in a car driven by someone else. Black youth (8.5%) reported highest percentage of being in a physical fight at school followed by multiple race youth (7.6%). White students were more likely to be bullied on school property compared to Blacks or Asians. Asian youth were less likely than other race groups to be threatened or injured with a weapon on school property. Hispanic, Black, American Indian/Alaskan Native youth were more likely not to go to school because they felt unsafe at school or on their way to or from school compared to white youth. Asian students were less likely than other race groups to have ever been physically forced to have sexual intercourse. American Indian/Alaska Native students were more likely than all race groups to have ever been physically forced to have sexual intercourse. These results indicate that, in an effort to reduce violence and unintentional injuries to youth, it is important to consider sex and race, to assure that prevention resources are directed to those at greatest risk. In real world school settings, these findings can be used to develop anti-bullying activities that incorporate understanding of different races/cultures, strengthen empathy for those who are different, reduce stigma and racial stereotypes. Schools can incorporate antiviolence, anti-bullying programs that raise awareness about the racial and gender differences that exist.

Keywords: Injury, Violence, Race, Sex

1. Introduction

The Youth Risk Behavior Survey data includes questions regarding unintentional injury and violence: Bullying, threats, physically forced to have sexual intercourse, and avoiding school due to not feeling safe at school or traveling to or from school. Behaviors that contribute to unintentional injury include not wearing a seat belt, riding with someone who's been drinking. Behaviors that contribute to violence include physical fighting, bullying, were threatened or

injured with a weapon on school property, did not go to school because they felt unsafe at school or on their way to or from school; and were ever physically forced to have sexual intercourse.

Injuries and violence among youth have a substantial emotional, physical, and economic cost to society. According to the WHO, injuries and violence place a massive burden on national economies, costing countries billions of US dollars each year in health care, lost productivity and law enforcement (WHO, 2021).

Prior study found that females were more likely to report being bullied, both in school and online (Webb et al., 2021). Previous research has also shown that youth involved in extracurricular sports was a protective factor for White youth but a potential risk factor for Hispanics and Asian Americans. (Peguero, 2015) It is important to identify racial and sex differences for school-based violence prevention programs. Violence and victimization occur among youth in the schools; weapons can increase injury and serious harm to students. In a prior studies, male youth were more likely than female students to carry a weapon to school. (Lowry et al., 2023) (Durant et al., 1997) Weapon carrying in school was more prevalent among students who were threatened or injured with a weapon at school (Lowry et al., 2023).

Unintentional injury and violence are an important public health topic for youth. This study aimed to discover any statistically significant differences by sex and race. Hypothesis is males are at higher risk for injury and violence and minority populations are also at higher risk for unintentional injury and violence. Bullying includes being bullied through texting, Instagram, Facebook, or other social media, ever during the 12 months before the survey.

2. Methods

Statistical analysis was performed on YRBS data imported into Epi Info 7 using procedures that accommodate the weighted sampling design of YRBS. YRBS is used to monitor priority health risk behaviors among youth in the United States. The national Youth Risk Behavior Survey (YRBS) uses sample design to produce a representative sample of 9th through 12th grade students. This research involves quantitative analysis of data. National data in YRBS High school student survey for 2021 were used to analyze the data. Baseline statistics were carried out and used chi-square to test for differences. Statistical analysis was carried out using Epi Info 7 software. Race and sex were controlled for in the study and 95% confidence intervals were calculated for subgroups. Confidence intervals were compared between groups in this study to determine if the groups were statistically different from each other. When confidence intervals of two groups do not overlap, it indicates a statistically significant difference between the two groups being compared. If the confidence intervals for the two groups do not overlap, it suggests that the difference between the groups is likely not due to chance and is considered statistically significant.

3. Results

For all tables below, the row percentages include % along with 95% confidence interval in parentheses and frequency counts at the bottom of each row.

Table 1. Seat belt use: Did not always wear a seat belt when riding in a car driven by someone else.

Year	Total	Female	Male
2021	39.9% (35.3–44.6) 12,777	38.1 % (33.8–42.7) 6,021	41.4 % (36.3–46.7) 6,605

No statistically significant difference between male and female youth in not always wearing a seat belt as a passenger. Nearly 40% of all youth reported not always wearing a seat belt when riding in a car driven by someone

else.

Table 2. Seat belt use by race: Did not always wear a seat belt (when riding in a car driven by someone else).

Race Year	Total	AI/AN	Asian	Black	Hispanic	NHOPI	White	Multiple race
2021	39.9 % (35.3–44.6) 12,777	43.6% (34.5–53.2) 101	29.3 % (20.9–39.4) 652	59.2 % (53.6–64.6) 1,533	43.6 % (39.8–47.4) 2,345	42.2 % (19.4–69.0) 35	34.9% (30.6–39.4) 7,198	39.6% (30.5–49.5) 684

Black youth reported statistically significant higher percentage than all other races in not always wearing a seat belt when riding in a car driven by someone else.

Male youth were more likely than females to report driving after drinking alcohol.

Table 3. Drove when they had been drinking alcohol by sex (in a car or other vehicle, one or more times during the 30 days before the survey, among students who had driven a car or other vehicle during the 30 days before the survey).

Year	Total	Female	Male
2021	4.6% (4.0–5.4) 8,673	3.4% (2.6–4.4) 4,084	5.8% (4.9–6.8) 4,499

Table 4. Drove when they had been drinking alcohol by Race: Drove When They Had Been Drinking Alcohol (in a car or other vehicle, one or more times during the 30 days before the survey, among students who had driven a car or other vehicle during the 30 days before the survey).

Race Year	Total	AI/AN	Asian	Black	Hispanic	NHOPI	White	Multiple race
2021	4.6% (4.0–5.4) 8,673	4.1% (1.2–13.2) 63	3.1% (1.5–6.5) 298	2.4% (1.4–3.9) 1,018	5.3% (3.9–7.3) 1,521	N/A 22	4.8% (3.9–6.0) 5,138	6.3% (3.9–10.0) 429

Table 5. Were in a physical fight on school property (one or more times during the 12 months before the survey).

Year	Total	Female	Male
2021	5.8% (4.4–7.5) 16,418	3.2% (2.7–3.9) 7,784	8.1% (5.7–11.3) 8,383

Hispanic youth reported highest percentage 5.3% of driving after drinking alcohol.

Males reported statistically higher percentage than females being in physical fighting on school property.

Table 6. Were in a physical fight on school property (one or more times during the 12 months before the survey).

Race Year	Total	AI/AN	Asian	Black	Hispanic	NHOPI	White	Multiple race
2021	5.8% (4.4–7.5) 16,418	3.1% (1.2–8.3) 139	1.7% (0.7–4.1) 774	8.5% (6.7–10.8) 2,232	5.4% (4.5–6.5) 3,054	0.9% (0.2–4.0) 53	5.4% (3.3–8.7) 8,851	7.6% (5.3–10.6) 915

Black youth (8.5%) reported highest percentage of being in a physical fight at school followed by multiple race youth (7.6%).

Table 7. Youth were electronically bullied (counting being bullied through texting, Instagram, Facebook, or other social media, ever during the 12 months before the survey) by sex.

Year	Total	Female	Male
2021	15.9% (15.0–16.8) 17,032	20.5% (19.3–21.7) 8,086	11.2% (10.3–12.2) 8,698

Females reported being electronically bullied compared to males.

Table 8. Youth were electronically bullied (counting being bullied through texting, Instagram, Facebook, or other social media, ever during the 12 months before the survey).

Race Year	Total	AI/AN	Asian	Black	Hispanic	NHOPI	White	Multiple race
2021	15.9% (15.0–16.8) 17,032	20.9% (14.3–29.4) 144	13.3% (9.9–17.6) 843	9.5% (8.4–10.9) 2,285	13.2% (10.6–16.3) 3,199	9.7% (5.9–15.5) 88	18.8% (17.2–20.4) 9,072	16.9% (12.8–22.0) 993

Black youth were less likely than other race groups to be electronically bullied.

Table 9. You were threatened or injured with a weapon on school property (such as a gun, knife, or club, one or more times during the 12 months before the survey).

Year	Total	Female	Male
2021	6.6%(5.9–7.4) 16,678	5.9%(4.9–7.1) 7,900	7.0%(6.3–7.8) 8,542

There was no statistically significant difference by sex in youth who were threatened or injured with a weapon on school property.

Table 10. Youth were threatened or injured with a weapon on school property (such as a gun, knife, or club, one or more times during the 12 months before the survey).

Race Year	Total	AI/AN	Asian	Black	Hispanic	NHOPI	White	Multiple race
2021	6.6% (5.9–7.4) 16,678	8.3% (3.8–17.2) 141	3.2% (2.2–4.8) 783	7.9% (6.4–9.6) 2,276	6.5% (5.5–7.7) 3,122	7.4% (1.6–28.5) 55	6.2% (5.4–7.2) 8,977	8.5% (5.6–12.6) 933

Asian youth were less likely than other race groups to be threatened or injured with a weapon on school property.

Table 11. Youth were bullied on school property during the 12 months before the survey.

Year	Total	Female	Male
2021	15.0%(14.1–15.8) 16,706	17.0%(15.8–18.3) 7,918	12.8%(11.3–14.5) 8,545

No statistically difference between females and males being bullied on school property.

Table 12. Youth were bullied on school property (during the 12 months before the survey).

Race Year	Total	AI/AN	Asian	Black	Hispanic	NHOPI	White	Multiple race
2021	15.0% (14.1–15.8) 16,706	17.8% (12.1–25.3) 141	10.8% (8.5–13.6) 824	8.5% (7.2–10.1) 2,254	12.4% (10.2–15.0) 3,113	8.9% (2.5–27.3) 83	17.9% (16.6–19.3) 8,914	17.5% (13.3–22.8) 980

Table 13. Did not go to school because they felt unsafe at school or on their way to or from school (on at least 1 day during the 30 days before the survey) by sex.

Year	Total	Female	Male
2021	15.0%(14.1–15.8) 16,706	17.0%(15.8–18.3) 7,918	12.8%(11.3–14.5) 8,545

White students were more likely to be bullied on school property compared to Blacks or Asians.

Females (10.5%) were statistically significant more likely than males (6.6%) to report they did not go to school because they felt unsafe at school or on their way to or from school.

Table 14. Did not go to school because they felt unsafe at school or on their way to or from school (on at least 1 day during the 30 days before the survey) by race.

Race Year	Total	AI/AN	Asian	Black	Hispanic	NHOPI	White	Multiple race
2021	8.6% (7.6–9.7) 17,110	13.3% (7.7–21.9) 145	4.5% (3.3–6.2) 847	12.1% (9.6–15.2) 2,290	11.3% (9.2–13.7) 3,218	8.5% (3.3–20.2) 84	6.6% (5.4–8.0) 9,128	8.2% (6.3–10.6) 997

Hispanic, Black, AI/AN youth were more likely not to go to school because they felt unsafe at school or on their way to or from school compared to white youth.

Table 15. Youth were ever physically forced to have sexual intercourse when they did not want to.

Year	Total	Female	Male
2021	8.5% (7.6–9.4) 14,158	13.5% (12.3–14.8) 6,606	3.6% (2.8–4.4) 7,343

There was a statistically significant difference between females 13.5% and males 3.6% in youth reporting they were ever physically forced to have sexual intercourse.

Table 16. Were ever physically forced to have sexual intercourse (when they did not want to) by race.

Race Year	Total	AI/AN	Asian	Black	Hispanic	NHOPI	White	Multiple race
2021	8.5% (7.6–9.4) 14,158	18.3% (12.1–26.6) 125	4.5% (3.2–6.2) 773	7.1% (5.0–10.0) 1,756	9.5% (8.2–10.9) 2,607	9.8% (4.7–19.4) 71	8.4% (7.4–9.5) 7,693	11.6% (9.1–14.5) 827

Asian students were less likely than other race groups to have ever been physically forced to have sexual intercourse. AI/AN students were more likely than all race groups to have ever been physically forced to have sexual intercourse.

4. Discussion

The YRBS data were analyzed to determine if there were statistically significant difference between sex and race for unintentional injuries and violence. No statistically significant differences were observed between male and female youth in not always wearing a seat belt as a passenger. Black youth reported statistically significant higher percentage than all other races in not always wearing a seat belt when riding in a car driven by someone else. Previous studies displayed similar results in Black youth reporting lowest seat belt usage and no difference by sex. (Evans et al., 2022) Potential reason for less seat belt use among black and Hispanic youth is from less parental modeling and encouragement of seatbelt use by parents and peers. Males (41%) reported slightly higher rates of less seatbelt use than females (38%). Males may be more likely to neglect safety measures like wearing a seat belt, leading to lower seat belt usage compared to females. Influence from peer pressure and the perception of how other males behave regarding masculinity of not wearing seat belt may contribute to lower rates among males.

Results are in line with previous research regarding differences in sex. Male youth were statistically more likely than females to report driving after drinking alcohol. Gender roles and cultural expectations can influence alcohol use. For example, males may use drinking to demonstrate masculinity, facilitate aggression, exert power, and exhibit more risky behavior. Hispanic youth reported the highest percentage (5.3%) of driving after drinking alcohol. Males reported statistically higher percentage than females being in physical fighting on school property. Females (10.5%) were statistically significant more likely than males (6.6%) to report they did not go to school because they felt unsafe at school or on their way to or from school. Statistically significant more females reported being electronically bullied compared to males.

Females (10.5%) were statistically significant more likely than males (6.6%) to report they did not go to school because they felt unsafe at school or on their way to or from school. Difference in female and male: “In addition to differences by age and race/ethnicity, we found that the leading causes of injury morbidity and mortality also greatly differed by sex” (Barrios et al., 2013).

Nearly 40% of all youth reported not always wearing a seat belt when riding in a car driven by someone else. “To address the prevention of motor vehicle crash injuries, the leading cause of unintentional injury deaths among those aged 5–19 years, the World Health Organization, in collaboration with global partners including CDC, has produced a technical package on traffic injury prevention.” (Ballesteros et al., 2018) Furthermore, previous research indicates the public health importance of unintentional injuries. “Unintentional injury death rates from 2013–2015 were highest among American Indian and Alaskan Native peoples (AI/AN), with the highest rates among AI/AN (63.6) and Black (66.8) infants, and AI/AN 15–19 year olds” (Ballesteros et al., 2018).

Asian youth were less likely than other race groups to be threatened or injured with a weapon on school property. Black youth (8.5%) reported highest percentage of being in a physical fight at school followed by multiple race youth (7.6%). This is similar to previous research. “Injuries by race/ethnicity showed important disparities, with all unintentional injuries ages 0–19 years showing the lowest rates among Asian/Pacific Islander and the highest rates among Blacks.” (Ballesteros et al., 2018) Students who experience discrimination may act out aggressively to protect themselves from further victimization. Systemic racism can create an environment where minorities may have limited access to resources.

Sixteen percent of youth reported being electronically bullied. Social media along with advances and wide availability of personal technology have made it possible for youth to be even more bold in their bullying. Social media provides bullies with an environment to say what they want and target others. Youth are not only subject to bullying but also cyberbullying, which can be significantly more difficult to manage when trying to hold bullies accountable. Bullies can be anonymous online or even create fake profiles (Nesbitt, 2024). Bullying victims should be supported and reassured in the school environment. Schools can limit access to personal technology during school hours. Specific programs to encourage reporting bullying to prevent underreporting. Schools should raise awareness about detrimental effects of cyberbullying. Schools should establish clear policies on bullying and cyberbullying that take into consideration race and sex differences.

This finding is very similar to previous studies of youth reporting 15% being bullied. (Webb et al., 2021) White students were more likely to be bullied on school property compared to Blacks or Asians. White youth reported higher rates of being bullied may be affected by the overall population distribution of whites in schools. Another possible explanation for higher reports of being bullied by white youth is that Black and Hispanic youth are less likely to report bullying, even when they experience the same behaviors that white youth experience. (Sawyer et al., 2008) In addition, previous research showed that youth who violate stereotypes may experience bullying and stereotypes linked to family socioeconomic status (SES), test scores, and sports participation may moderate the associations between bullying victimization and race. (Peguero and Williams, 2013) Black youth were less likely than other race groups to be electronically bullied. These findings were also shown in previous research. (Webb et al., 2021) Hispanic, Black, American Indian/Alaskan Native youth were more likely not to go to school because they felt unsafe at school or on their way to or from school compared to white youth.

Schools can play a critical role in preventing injuries from occurring on school property and at school-sponsored events. “Schools can teach students the skills needed to promote safety and prevent unintentional injuries, violence, and suicide ...the school health recommendations for preventing unintentional injury, violence, and suicide summarized here were developed by the Centers for Disease Control and Prevention [CDC] in collaboration with experts from universities and from national, federal, state, local, and voluntary agencies and organizations” (Barrios et al., 2013).

There was statistically significant difference between females 13.5% and males 3.6% in youth reporting they were ever physically forced to have sexual intercourse. Uneven power dynamics between males and female youth can contribute to violence. American Indian/Alaskan Native youth were more likely than Asian, Black, Hispanic, and white youth groups to have ever been physically forced to have sexual intercourse. Asian students were less likely than other race groups to have ever been physically forced to have sexual intercourse. This finding for Asian students is consistent with previous research. (Thompson et al., 2012) The most likely victims of sexual violence are young and female. (Basile & Saltzman, 2002) “The presence of a disparity by race/ethnic group in the likelihood of being forced to have intercourse against one's will can be used to develop preventive interventions targeted toward those at greatest risk” (Thompson et al., 2012).

These results point for the need for an effort to reduce violence and unintentional injuries in youth, it is important to consider differences in sex and race, to assure that prevention resources are directed to those at greatest risk. In real world school settings, these findings can be used to develop anti-bullying workshops that incorporate understanding of differences by races and sex, strengthen empathy for those who are different, reduce stigma and racial stereotypes. Schools can incorporate antiviolence, anti-bullying programs that raise awareness about the racial and gender differences that exist. Acknowledging these differences and leveraging programs that focus on reducing risks with this in mind, schools should address attitudes about aggression, racial identity and bullying experiences.

Prevention opportunities extend beyond addressing individual risk behaviors to include programs, policies, and strategies that enhance protective factors within the family, schools, neighborhood, and community. Findings from this study such as differences by race and sex should be considered in developing a prevention plan, especially for biased-based bullying. School districts at the local level should monitor and adjust local bullying prevention programs based on analysis of local school data and incorporate best practices in bullying prevention. Possible protective factors may include having a good performance at school and good social skills, coming from a stable family, being attached to parents, and having positive relationships with friends.

“The frequency, severity, and potential for death and disability of these injuries together with the high success potential for prevention, make injury prevention a key public health goal to improve child and adolescent health in the future.” (Ballesteros et al., 2018) “The guidelines include recommendations related to the following eight aspects of school health efforts to prevent unintentional injury, violence, and suicide: a social environment that promotes safety; a safe physical environment; health education curricula and instruction; safe physical education, sports and recreational activities; health, counseling, psychological, and social services for students; appropriate crisis and emergency response; involvement of families and communities; and staff development.” (Barrios et al., 2013) Further research needs to be conducted in bullying, violence prevention and unintentional injuries given the fact that youth are reporting high rates of risky behavior.

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