



# Suicidal thoughts, risky driving, and crashes among U.S. adolescents

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## ABSTRACT

**Introduction:** Motor-vehicle crashes and suicide are two of the leading preventable causes of death among teenagers. **Method:** To investigate the association between suicidal thoughts and crashes we analyzed cross-sectional survey data on suicidal thoughts, risky driving behavior, and crash involvement. **Results:** We found evidence of a positive correlation between suicidal thoughts with crash involvement and each of the risky driving behaviors measured in the survey. **Practical Applications:** This is the first time this association between suicidal thoughts and crashes has been described in this population

## 1. Introduction

Motor-vehicle crashes and suicide are two of the leading preventable causes of death among teenagers, resulting in 5,429 deaths in 2022 among 13–19 year olds. (Centers for Disease Control and Prevention. WISQARS Fatal Injury Reports., 2024) Using data from the 2019 Youth Risk Behavior Survey (YRBS), Ganson and colleagues first described the association between suicidality, defined as suicidal thoughts, plans and attempts, and risky driving, (Ganson et al., 2022) and found a positive correlation between the severity of suicidality and self-reported risky driving behaviors. However, the association between suicidal thoughts and crashes remains unexamined. The purpose of this study was to extend the research on suicidal thoughts and risky driving behaviors by including a measure of crashes in a representative sample of U.S. youth. (See Table 1).

## 2. Methods

A nationally representative survey of 267 drivers (ages 16–19) was fielded by the National Opinion Research Center (NORC) between May 4th and June 10th, 2022. Respondents were recruited from NORC's AmeriSpeak platform, a probability-based panel of randomly sampled U. S. households. (Dennis, 2019) The Johns Hopkins Bloomberg School of Public Health Institutional Review Board approved this study (IRB00019326).

**Scales:** Risky driving scales were adapted from the Youth Risk

Behavior Survey. (Yellman MA. Transportation Risk Behaviors Among High School Students — Youth Risk Behavior Survey, United States, 2019) Respondents were asked if they engaged in a range of risky driving behaviors in the last 30 days. Crash involvement was measured by the following item: *In the last 12 months, how many crashes have you been involved in while you were driving?* Response options included 0, 1, 2, 3 or 4 or more crashes.

Suicidal thoughts were assessed through a survey item from the Brief Symptom Inventory. (Ehsani et al., 2024).

Respondents were asked how uncomfortable they felt during the past week due to thoughts of ending their life. Response options included “not at all,” “a little,” “moderately,” “pretty often,” and “extremely.” For analysis purposes, the suicidal thoughts item was aggregated to a binary variable of any discomfort due to suicidal thoughts compared to none for the first set of analyses.

**Analyses.** The association between past week suicidal thoughts and past 30 days risky driving behaviors was assessed by comparing the weighted prevalence of each risky driving behavior and crash involvement between those with and without suicidal thoughts. Logistic regression models assessed suicidal thoughts in relation to each risky driving behavior and crash involvement while controlling for respondent sex and race, and to assess differences in the predicted probability of crash involvement by severity of past week suicidal thoughts. Analyses were conducted using R v. 4.3.1.

**Abbreviations:** CI, Confidence Interval; NORC, University of Chicago's National Opinion Research Center; YRBS, Youth Risk Behavior Survey.

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**Table 1**

Odds ratios and confidence intervals for suicidal thoughts in relation to key outcomes.

Outcome	Odds Ratio [95% CI]
Distracted driving*	2.68 [1.4–5.14]
Drunk driving**	7.42 [3.46–15.91]
Marijuana use**	4.52 [2.26–9.02]
Other drug use**	7.77 [3.3–18.26]
Inconsistent seatbelt use**	4.03 [2.06–7.88]
Crash involvement**	4.34 [2.15–8.74]

Note:

\* indicates significance at 0.05,

\*\* indicates significance at 0.001.

### 3. Results

The survey completion rate was 42.8% with a final sample of 267 16–19-year-olds (median age, 17.5 years; 130 females [48.4%]). The prevalence of suicidal thoughts in the sample was 20.8% in the prior week, with 15% reporting moderate or slight discomfort due to suicidal thoughts and 5.8% reporting frequent or extreme discomfort from suicidal thoughts. The prevalence of risky driving behaviors have been described elsewhere. (Ehsani et al., 2024) Briefly, approximately two-thirds of the sample (63.27% 95% Confidence Interval (CI): 55.89–70.64) reported at least one risky driving behavior. Over half the sample (52.84% 95% CI: 44.95–60.72) reported texting/emailing while driving. Over one-fifth reported inconsistent seat belt use 23.78% [95% CI: 16.63–30.93] and driving after using marijuana (20.81% [95% CI: 13.81–27.81]). One in six teenagers reported driving after drinking alcohol (16.3% [95% CI: 9.98 – 22.62] and 8.97% [95% CI: 4.47–13.47] reported driving after any other drug use. Approximately one in six respondents reported being in one or more crashes (15.59% 95% CI: 10.19–20.98] in the past year.

**Suicidal thoughts and risky driving.** Individuals who reported suicidal thoughts in the past week were significantly more likely to engage in risky driving behaviors in the prior 30 days. The increased prevalence of risky driving behaviors among those with suicidal thoughts ranged from being 19 percentage points higher (in the case of distracted driving, drink driving and marijuana use) to 28 percentage points higher in the

case of not always wearing a seatbelt.

**Suicidal thoughts and crashes.** Individuals reporting suicidal thoughts were significantly more likely to be involved in a crash in the past year. The prevalence of crash involvement for those with suicidal thoughts was nearly 25 percentage points higher than those without suicidal thoughts (35.1% compared to 10.5%).

**Association between suicidal thoughts, risky driving, and crashes.** Suicidal thoughts were associated with crash involvement and each of the risky driving behaviors measured in the survey. The odds of using drugs other than marijuana prior to driving and the odds of drunk driving were both seven times higher for those teenagers reporting suicidal thoughts. The odds of crash involvement was more than four times higher for teens with suicidal thoughts compared to those without.

**Probability of Crash Involvement for those with Suicidal Thoughts.** The predicated probability of crash involvement increased as the intensity of discomfort related to suicidal thoughts increased. Teen drivers who reported feeling moderate discomfort from suicidal thoughts in the previous week had a 146% higher probability of crash involvement in the past year compared to those without any discomfort – increasing from a 13% to 32% probability of crashing. Those with extreme discomfort from suicidal thoughts in the previous week had a 61% probability of crashing. Fig. 1 presents a dose–response curve for level of suicidal thoughts and probability of crash involvement.

### 4. Discussion

Suicide rates have increased among young people by 62% from 2007 to 2021. (Curtin SC, Garnett MF. [Suicide and Homicide Death Rates Among Youth and Young Adults Aged 10–24: United States, 2023](#)) The field of adolescent health and injury prevention cannot ignore mental health in efforts to advance road safety among young drivers. Prospective longitudinal studies documenting the timing of mental health symptoms and suicidal thoughts in relations to risky driving behaviors and crashes with an eye toward early intervention are critically needed to improve road safety for teenagers and other drivers.

#### 4.1. Limitations

The NORC AmeriSpeak panel recruitment was consistent with best-

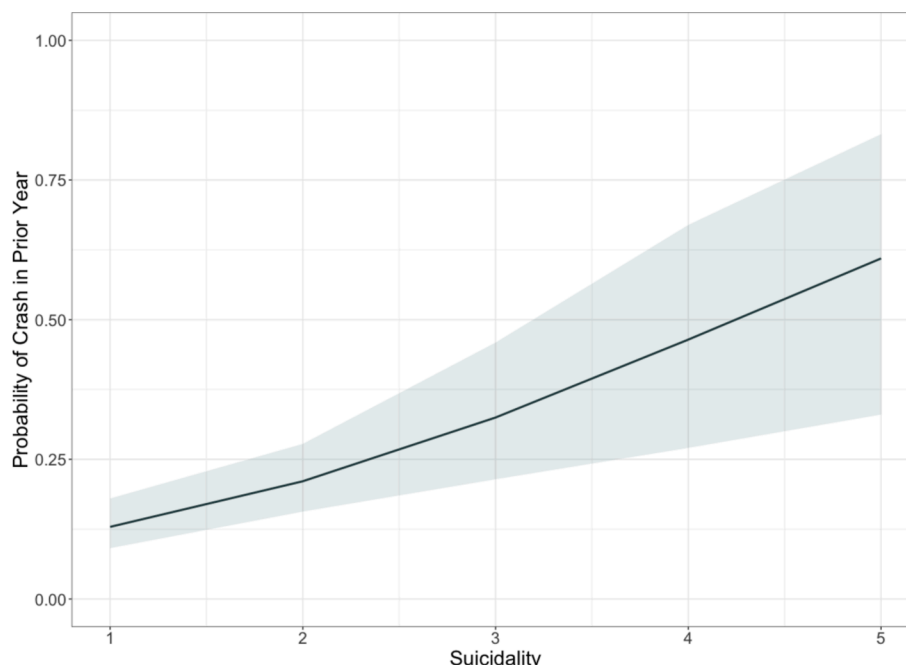


Fig. 1. Predicted Probability of Crash in Prior Year by Level of Suicidal Thoughts.

practice standards for survey research, but these results may still be vulnerable to sampling biases. Risky driving behaviors could be under-reported. Participants self-reported crashes were reported in the prior 12 months, and suicidal thoughts within one week of the survey, so the causal link between suicide and crashes cannot be confirmed.

## 5. Conclusion

Parents, young people, and pediatricians need to be alerted the strong co-occurrence of driving risks with suicidal thoughts.

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## 7. Implications and Contributions

Suicidal thoughts were strongly and significantly associated with a higher prevalence of risky driving behavior in the last month, and crashes in the last year. Parents, adolescents, and pediatricians need to be alerted the strong co-occurrence of driving risks with suicidal thoughts.

## CRediT authorship contribution statement

**Johnathon P. Ehsani:** Writing – review & editing, Writing – original draft, Supervision, Project administration, Methodology, Investigation, Funding acquisition, Conceptualization. **Michelle Duren:** Methodology, Investigation, Formal analysis, Data curation. **Brydon Grant:** Writing – original draft, Supervision, Investigation, Formal analysis. **Holly Wilcox:** Writing – review & editing, Writing – original draft, Supervision.

## Declaration of competing interest

The authors declare that they have no known competing financial interests or personal relationships that could have appeared to influence the work reported in this paper.

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