Gender Differences in Perceptions and Self-Reported Driving Behaviors Among Teenagers.

Gavin C. Barr Jr. MD
Lehigh Valley Health Network, Gavin.Barr_jr@lvhn.org

Kathleen E. Kane MD
Lehigh Valley Health Network, kathleen_e.kane@lvhn.org

Robert D. Barraco MD, MPH
Lehigh Valley Health Network, robert_d.barraco@lvhn.org

Timarie Rayburg

Lauren Demers

See next page for additional authors

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Authors

Gavin C. Barr Jr. MD; Kathleen E. Kane MD; Robert D. Barraco MD, MPH; Timarie Rayburg; Lauren Demers; Chadd K. Kraus DO, MPH; Marna R. Greenberg DO, MPH, FACEP; Valerie Rupp RN, BSN; Kimberly M. Hamilton; and Bryan G. Kane MD

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GENDER DIFFERENCES IN PERCEPTIONS AND SELF-REPORTED DRIVING BEHAVIORS AMONG TEENAGERS

Gavin C. Barr Jr., MD,* Kathleen E. Kane, MD,* Robert D. Barraco, MD, MPH,† Timarie Rayburg, DO,* Lauren Demers, DO,* Chadd K. Kraus, DO, MPH,* Marna Rayl Greenberg, DO, MPH,* Valerie A. Rupp, RN, MSN, CRNP,* Kimberly M. Hamilton, BA,* and Bryan G. Kane, MD*

*Department of Emergency Medicine and †Department of Surgery, Lehigh Valley Hospital and Health Network/USF Morsani College of Medicine, Allentown, Pennsylvania

Reprint Address: Marna Rayl Greenberg, DO, MPH, Department of Emergency Medicine, Lehigh Valley Hospital and Health Network/USF Morsani College of Medicine, 1909 Earls Court, Allentown, PA 18103

☐ **Abstract—Background: The Centers for Disease Control reports that motor vehicle crashes (MVCs) are the leading cause of injury and death among U.S. teenagers, and disproportionately affect males. Among preventable causes of MVCs involving teenage drivers, distracted driving continues to be a serious public health problem. Objectives: To describe gender differences in teenage drivers' self-perceptions of safe driving behaviors, and self-reported risk behaviors and distractions while driving. Methods: We prospectively surveyed teenage drivers from four high schools in Pennsylvania and New Jersey. Gender comparisons were made between self-reported perceptions and self-reported driving behaviors. Descriptive statistics and chi-squared testing were used in data analyses; significance was set at $p < 0.05$. Results: Seven hundred fifty-six high school teenage drivers completed surveys. Males (52%) and females (48%) were equally distributed; 32% of males reported that they were extremely safe drivers, whereas only 18% of females reported that they were extremely safe drivers ($p < 0.001$). Significantly more females (91%) compared to males (77%) reported always wearing their seatbelts ($p < 0.001$). Female drivers were more likely than male drivers to self-report that they always make their passengers wear a seat belt (76% vs. 63%, $p < 0.001$). A higher proportion of males reported using their cell phones while driving, compared to females (68% vs. 56%, $p = 0.004$), and 42% of males reported texting while driving, compared to 34% of females ($p = 0.037$). Conclusion: Teenage male drivers perceive themselves to be safe drivers, but report engaging in more distracted driving and risky behaviors compared to females. These results suggest that there is an opportunity for gender-specific educational and injury prevention programs for teen drivers.** © 2015 Elsevier Inc.

☐ **Keywords—distracted driving; gender differences**

INTRODUCTION

Motor vehicle crashes (MVCs) are the leading cause of death for U.S. teenagers. According to the Centers for Disease Control and Prevention, in 2010 approximately 2700 teens aged 16–19 years were killed, and another 282,000 were injured, in MVCs (1). Teenage drivers aged 16–19 years are three times more likely to crash than drivers older than 20 years (1,2). Among this population, those at especially high risk for MVC are newly licensed drivers, male drivers, and teens driving with teen passengers (1).

Distracted driving has also been identified as a preventable cause of MVC-related morbidity and mortality among teenagers, accounting for 11% of all fatal MVCs among teenage drivers (3). The National Highway Traffic

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Safety Administration defines distracted driving as focusing on an activity other than driving while operating a vehicle, and can include activities such as eating, reading, smoking, and cell phone use (3). Text messaging has been identified as a particularly alarming distraction because it requires cognitive, visual, and tactile attention from the driver (3). Despite public health, legislative, and regulatory efforts, distracted driving continues to be a significant public health problem, with more than 3330 distraction-affected crashes resulting in injuries to an estimated 421,000 people in 2012 (3).

Teen drivers are at risk for increased crash risk due to distractions, yet are often unaware of the magnitude of their risky behaviors, or when aware, act in ways that contradict their knowledge. Ginsburg et al. report that adolescents understand the danger of driving while intoxicated, but do not recognize cell phone use or having teenage passengers in the car as a hazard or distraction to their driving (4). Additionally, although teenage drivers acknowledge that texting and driving is dangerous, just under half of teenage drivers report that engaging in texting, calling, or using phone-based e-mail while driving is dangerous (5,6).

The relationship between adolescent driver distraction and gender seems less than clear. Rhodes and Pivik describe an association between the male gender and a higher incidence of risky driving behaviors, yet Heck and Carlos found that passenger distraction was more common among adolescent females (7,8). To further understand this association, we sought to determine the gender differences between self-reported risk perceptions of teen drivers and their self-reported driving behaviors, in regard to seat belt compliance, cell phone use, and driver distractions.

MATERIALS AND METHODS

This was a prospective survey study conducted during the 2007–2008 school year at four high schools in Pennsylvania (PA) and New Jersey (NJ). Two school districts in PA and one in NJ were included. Of the two districts in PA, one school district had a single high school (District A), and the other had two schools on separate campuses (District B). School districts were selected to be representative of suburban schools in each state and were in the same media market and athletic conferences. The districts—although subject to different laws and regulations as applied to driving—were comprised of study subjects with similar cultural and geographic environments. During the study period, driving laws related to cell phone use differed between states. NJ had a ban on cell phone use while driving. PA had no law in place restricting the use of cell phones while driving. Both states had laws mandating the use of seat belts, with violations of seat belt use an indication for primary traffic stops in New Jersey.

Approval from all of the school districts and the hospital's Institutional Review Board was obtained. The voluntary, confidential survey was distributed to a convenience sample cohort of all students at the participating high schools. The survey instrument (Appendix, available online) was developed for the project by the study team. It queried respondents on their knowledge, attitudes, and self-reported behaviors regarding safety issues, their driving and distracted driving behaviors, and the driving behavior of parents and adults. Ten surveys were piloted to high school students (not included in the study data) for content validity prior to being administered. Based on their review, only minor revisions in formatting were recommended by the study team.

Continuous variables were summarized using descriptive statistics, and categorical variables were reported using counts and percentages. All tabulations were based on observed data. Mean differences were compared using a one-factor analysis of variance. Differences in proportions were compared using a chi-squared test or a Fisher's exact test. Tests of significance were reported using a type 1 error rate of 5%. Computations were performed using SAS® software, version 9.2 (SAS Institute, Inc., Cary, NC).

RESULTS

Surveys of 756 teens from four high schools in PA and NJ were returned, representing an 86% return rate. The demographics of age, gender, school, and hours/miles driven per week are reported in Table 1. Males (52%) and females (48%) were equally distributed. Thirty-two percent of males reported they were extremely safe drivers, whereas only 18% of females reported that they were extremely safe drivers ($p < 0.001$). Significantly more females (91%) compared to males (77%) reported always wearing their seatbelts ($p < 0.001$). Female drivers were more likely than male drivers to self-report that they always make their passengers wear a seat belt (76% vs. 63%, $p < 0.001$). A significantly higher proportion of females (80%) always have the front seat passengers wear seatbelts while driving, compared to males (70%); $p = 0.018$. A higher proportion of females (62%) always have the back seat passengers wear seatbelts while driving, compared to males (55%), however, the difference in proportions was not significant ($p = 0.161$). A significantly higher proportion of males (14%) report having received a ticket for a driving violation (not a parking ticket) compared to females (4%); $p < 0.001$. Males were also significantly more likely than females to self-report having ever performed distracted driving behaviors (Table 2).

Table 1. Demographics by School and Overall

	School				
	1	2	3	4	All Schools Combined
Gender					
Male	132 (53%)	94 (48%)	75 (54%)	91 (53%)	392 (52%)
Female	117 (47%)	100 (52%)	65 (46%)	82 (47%)	364 (48%)
Age (years)	16.8 ± 16.77	16.8 ± 16.79	16.7 ± 16.74	16.8 ± 16.75	16.8 ± 16.76
Hours driven per week	10 ± 15.79	12.1 ± 15.99	9.1 ± 8.78	7.9 ± 10.16	9.9 ± 13.59
Miles driven per week	84.8 ± 86.87	88.7 ± 138.46	88.7 ± 129.4	71.3 ± 87.94	86.9 ± 102.93

Schools: 1 = New Jersey, 2–4 = Pennsylvania.

On a scale of 1 (not safe) to 6 (extremely safe), the median response to "do you feel your best friend is a safe driver?" was 4 (42%). The median response to "how many drinks can a 150-lb person have before they are driving impaired?" was ≤ 1 (42%). Asked to rank 12 behaviors from most to least dangerous, respondents most commonly ranked driving under the influence of alcohol or drugs as the most dangerous (74%) and driving with another teenager(s) as the least dangerous (24%).

A higher proportion of respondents in PA (34%) as compared to NJ (22%) reported they had talked on a cell phone while driving; $p < 0.001$. Likewise a higher proportion of respondents in PA (20%) as compared to NJ (14%) reported they had text messaged while driving, $p = 0.003$.

DISCUSSION

The data in our study further highlight the self-reported distracted driving behaviors of teenagers and affirm the need for concerted efforts aimed at reducing risk for teenage drivers. A previous study by Ginsburg et al. recorded in the National Young-Driver Survey that only 28% of teens correctly believe that talking on a cell phone while driving makes a major difference to driving safety (4). Efforts to date have included educational programs and legislative changes, yet distracted driving remains a serious public health challenge in this population (9). Given the between-gender differences we found, our data suggest that future interventions should be tailored for males and females.

Table 2. Self-reported Distracted Driving Behaviors Compared by Gender

Self-reported Distracted Behavior While Driving	Male (%)	Female (%)	*p*-Value
Cell phone use	68	56	0.004
Texting on cell phone	42	34	0.037
Eat or drink	57	49	0.036
Smoke	11	7	0.042

We also found greater discordance between perceived and actual risk in teen male drivers than females. For example, teen male drivers in this study perceive themselves as being safe drivers, yet report engaging in behaviors that put them at risk more frequently than females (including their personal choices regarding seat belt use, their encouragement of passengers to use seatbelts, and their personal distractions, such as use of cell phones, smoking, and eating while driving). Males in our cohort were significantly more likely to report being cited for moving violations; a successful intervention may use this as an illustration to assist young men in overcoming this cognitive disconnect.

In addition to the gender-specific differences that we describe, there are overall concerns regarding teen driving safety, regardless of gender, that should be highlighted. Less than 80% overall of teen drivers in our study reported having passengers always wear their seatbelts. Additionally, only a very small percentage (17%) of the sample reported having a driving safety contract with their parent(s).

Of note, there were differences in self-reported cell phone use (talking and text messaging while driving) between students in PA and NJ. While these results might be encouraging to legislators, it is unclear how these differences support the ban that NJ evoked to curtail cell phone use. It may simply be that students in NJ were less likely to openly self report something that was identified as illegal in their jurisdiction.

The results of our study also have potential implications for the emergency physician. Emergency departments (EDs) have been identified as an important venue for providing education and intervention in a variety of injury prevention efforts. Recognizing the significant public safety dangers associated with these behaviors, the American College of Emergency Physicians has a policy statement guiding emergency physicians caring for distracted and impaired drivers (10). We have identified gender differences in self-perceptions and self-reported driving behaviors, which provide a foundation for further research into gender-specific safe driving initiatives from an emergency medicine perspective.

Limitations

This study included surveys from students in PA and NJ; the results may not be geographically generalizable to other communities. Second, there is no ability to match the surveys to the actual teen driving behavior. The authors do not know of existing literature that could reliably assist in predicting whether these self-reported activities are under- or overestimated in comparison to actual driving behaviors. However, our results suggest that the teenagers in this study have discordance between their self-perceptions of safe driving behavior and their reported driving behavior, making the results informative about how self-perception might impact behavior. Finally, there are the already well-described limitations of survey research.

CONCLUSIONS

Teenage male drivers perceive themselves to be safe drivers, but report engaging in more distracted driving and risky behaviors compared to females. These results suggest there is an opportunity for gender-specific educational and injury prevention programs for teen drivers. Additionally, ED injury prevention efforts could be aimed at both teenagers' perceptions of their driving behaviors and at reducing risky driving behaviors. The results of this study can help inform educational, regulatory, and statutory efforts at reducing risk for teen drivers. Further research could investigate the perceived, reported, and actual driving behaviors among teenage drivers.

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ARTICLE SUMMARY

1. Why is this topic important?

Motor vehicle crashes (MVCs) are the leading cause of death for U.S. teenagers. Among this population, those at especially high risk for MVC are newly licensed drivers, male drivers, and teens driving with teen passengers. Distracted driving has also been identified as a preventable cause of MVC-related morbidity and mortality among teenagers.

2. What does this study attempt to show?

We set out to describe gender differences in teenage drivers' self-perceptions of safe driving behaviors, and self-reported risk behaviors and distractions while driving.

3. What are the key findings?

Teenage male drivers perceive themselves to be safe drivers, but report engaging in more distracted driving and risky behaviors compared to females.

4. How is patient care impacted?

These results suggest that there is a potential opportunity for gender-specific educational and injury prevention programs for teen drivers. Emergency Department prevention efforts could be aimed at both teenagers' perceptions of their driving behaviors and reducing risky driving behaviors.

ONLINE APPENDIX: SURVEY INSTRUMENT

Distracted Driver Education Initiative

School _____ Date _____
Age _____ Grade _____ Male Female
Do you drive? Yes No
****** IF NO, SKIP TO PAGE # 4, IF YES, PLEASE ANSWER ALL QUESTIONS ******
Do you currently drive under a (circle one) Permit License
What date did you get your permit? _____
What date did you get your license? _____
Did you have any formal driver's training? Yes No
If yes, how many hours? _____ hrs
Do you own your own car? Yes No
Did you pay for your car? Yes (in full) Shared No
Do you pay for car insurance? Yes (in full) Shared No
How many hours a week do you drive (estimate)? _____ hrs
How many miles a week do you drive (estimate)? _____ miles
Do you drive mainly during the day or at night? Day Night
Do you drive to school? Yes No
If yes, how often? <1/wk 1-2/wk 2-3/wk Daily
Have you driven in? Pennsylvania New Jersey Both
Does your driving behavior change depending on the state in which you drive? (for example driving in Pennsylvania vs. New Jersey)?
Yes No
If yes, how does it change? _____
Does the car you drive have seatbelts? Yes No
Does the car you drive have airbags? Yes No
What type of transmission does your car have? Manual Automatic
When you are driving, how often do you wear your seatbelt?
Always Usually Sometimes Never
When you are driving, how often do passengers in your car wear their seatbelt?
Always Usually Sometimes Never
Do your parents wear seatbelts when you are driving?
Always Usually Sometimes Never
Do you feel you are a safe driver?
1 2 3 4 5 6
Not Safe Extremely Safe
Have you ever been pulled over by the police? Yes No
If yes, how many times? _____
Have you ever received a ticket for a driving violation (not a parking ticket)?
Yes No
Have you ever done any of the following (circle all applicable)?

Talk on cell phone while driving
If yes, do you use a hands free setup?
Always Usually Sometimes Never
Text message while driving
Drive with another teenager(s) as a passenger
Drive while using an MP3 player
If yes, do you use headphones?
Always Usually Sometimes Never
Smoke while driving
Eat/Drink while driving

Drive under the influence of alcohol or drugs
Speed
Drive with a pet in the car
Apply makeup while driving
Listen to loud music on the radio/CD player while driving
Read while driving

Have you done any of the following in the past week (circle all applicable)?

Talk on cell phone while driving
If yes, did you use a hands free setup?
Always Usually Sometimes Never
Text message while driving
Drive with another teenager(s) as a passenger
Drive while using an MP3 player
If yes, did you use headphones?
Always Usually Sometimes Never
Smoke while driving
Eat/Drink while driving
Drive under the influence of alcohol or drugs
Speed
Drive with a pet in the car
Apply makeup while driving
Listen to loud music on the radio/CD player while driving
Read while driving

Rank the following in order of most dangerous to least dangerous, with 1 being most dangerous, and 12 being least dangerous:

___ Talking on cell phone while driving
___ Text messaging while driving
___ Driving with another teenager(s)
___ Driving while using an MP3 player
___ Smoking while driving
___ Eating/Drinking while driving
___ Driving under the influence of alcohol or drugs
___ Speeding
___ Driving with a pet in the car
___ Applying makeup while driving
___ Listening to loud music while driving
___ Reading while driving

Do you have a driving safety contract with your parents? Yes No
When you are a front seat passenger, how often do you wear your seatbelt?
Always Usually Sometimes Never
When you are a rear seat passenger, how often do you wear your seatbelt?
Always Usually Sometimes Never
Do your parents wear seatbelts when they are driving?
Always Usually Sometimes Never
Do you feel your parents are safe drivers?
1 2 3 4 5 6
Not Safe Extremely Safe
Do you feel your best friend is a safe driver?
1 2 3 4 5 6
Not Safe Extremely Safe

Have you ever been in a car crash? Yes No

If yes, how many times? _____

If yes, who was the driver (if multiple, circle all applicable)?

You Parent Relative Friend Other

Have you ever discussed driving safety with your parents? Yes No

How many alcoholic drinks can a 150-lb person have before they are driving impaired?

_____

How many alcoholic drinks can a 150-lb person have before they are legally intoxicated?

_____