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Original article

The association between states' texting regulations and the prevalence of texting while driving among U.S. high school students

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ABSTRACT

Purpose: To determine which distracted driving laws were associated with decreased texting while driving among U.S. teenage drivers.
Methods: Data from the 2013 Youth Risk Behavior Surveillance System survey were merged with states' distracted driving legislation. The prevalence of texting while driving was assessed for different laws using log-binomial regression.
Results: Approximately 39.0% of students reported texting while driving at least once in the 30 days before survey. Compared to states with universal texting bans along with young driver all cellphone bans, the adjusted ratio of texting while driving was 0.94 (95% confidence interval [CI], 0.77–1.16) in states with no bans, 1.33 (95% CI, 1.11–1.58) for young driver bans only, 1.24 (95% CI, 1.00–1.52) in states with bans for young drivers but no young driver all cellphone bans, and 0.89 (95% CI, 0.66–1.19) in states with universal texting bans. The prevalence of texting was 28% less in states with delays of full licensure for texting offenses (prevalence ratio = 0.72; 95% CI, 0.59–0.88).
Conclusions: Universal texting bans along with young driver all cellphone bans may be more effective in reducing texting while driving. Delays of full licensure may dissuade young drivers from texting and driving.

Introduction

The use of mobile technology in the U.S. has been increasing at an exponential rate [1]. Youth are receptive to these technologies and are apt to incorporate them into their daily life [2]. Technology can pose additional risks to young drivers' safety as it can serve as an additional distraction while driving [2,3]. Previous research has shown that drivers 16 to 19 years of age experience more distractions within the vehicle resulting in motor vehicle collision compared with other age groups [4]. Research has also shown that motor vehicle fatalities due to distracted driving are steadily increasing [5], and mobile technologies are significant contributors of motor vehicle collision [6].

It is fairly established in the literature that the use of mobile technologies while driving, particularly texting, can affect driving ability and/or collision risk. Experimental studies have shown that when individuals are asked to send text messages in a simulated driving environment, they are more likely to crash [7–9]. Results from a self-reported survey of students aged 9 to 17 years demonstrated a positive association between those who accessed the Web or texted while driving and traffic collisions [10]. Unfortunately, 45% of all U.S. high school students aged 16 years and older self-reported that they sent text messages or e-mails while driving in 2011 [11].

In an effort to protect the public, numerous states have enacted legislation regulating the use of mobile technologies while driving. As of November 2014, 37 states and the District of Columbia (DC) restricted cellphone usage by teenage drivers thereby prohibiting them from talking, texting, e-mailing, or accessing the Web while driving [12]. Additionally, 44 states and DC prohibited text messaging while driving for all ages [12], and 42 states and DC have primary enforcement of these laws [12]. Primary enforcement allows law enforcement officers to stop and cite an individual for the observed offense and/or violation as opposed to secondary enforcement which only allows an officer to cite an individual if the violation was observed in conjunction with a primary offense.

Although numerous cellphone use while driving laws have been passed among states, relatively few studies have examined the

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effectiveness of such laws to date [13-22]. Specifically, no nationally representative studies have investigated whether state texting laws are associated with decreased texting while driving in a high school–aged population. Therefore, the purpose of this analysis is to examine the relationship between individual state's texting while driving regulations and the prevalence of texting while driving among a nationally representative group of U.S. high school students.

Material and methods

Data sources

The primary data source was the 2013 Youth Risk Behavior Surveillance System (YRBSS) survey. The YRBSS is an anonymous, voluntary, self-report survey conducted biennially by the Centers for Disease Control and Prevention which monitors behaviors that contribute to morbidity and mortality among U.S. youth [23]. It involves a nationally representative sample of 9th to 12th grade students enrolled in public and private schools [23]. The methodology of the YRBSS has been described in detail elsewhere [24]. Although the survey is nationally representative, not all states are sampled [24].

A data set of each states' distracted driving legislation in effect from January 1, 2013 to December 31, 2013 was compiled from various sources including Web searches [25], the Insurance Institute for Highway Safety [12], and the Governor's Highway Safety Association [26]. Each piece of legislation that was purported to exist was researched and retrieved from the respective states' legislative archives, read, and coded independently by two individuals. The data set contained information on the type of bill passed, enacted and effective dates, if there was primary or secondary enforcement, amount of fines, who the law applied to (i.e., all drivers, drivers <18, bus drivers, and so forth), and whether the delay of full licensure could be imposed on drivers holding learner's permits or intermediate licenses. The data set was verified for accuracy by both coders and was merged with the 2013 YRBSS data set.

Study population

The study population included students who: (1) indicated that they had driven within the past 30 days, (2) were of the age and residence where driver cellphone regulations applied, and (3) were not currently residing in Florida or Michigan. Because these two states had legislation passed during the school year, there was no way of determining if the surveys preceded these law changes. Of the 13,583 participants, 6216 met study inclusion criteria. Because of the methodology of the YRBSS survey (i.e., it is nationally representative but not all states are sampled), this resulted in the inclusion of high school students from 24 states (i.e., AL, AR, AZ, CA, CO, CT, GA, ID, IL, IN, KS, KY, MD, MN, MO, MS, NC, NJ, NY, OH, PA, TX, VA, and WA). Although other states have texting while driving legislation, they were not included in the analysis because they were not sampled.

Variables

The question on the 2013 YRBSS survey asked, "During the past 30 days, on how many days did you text or e-mail while driving a car or other vehicle?" [23] Respondents had the option of selecting one of the following responses: they did not drive a vehicle in the past 30 days, zero days, 1–2, 3–5, 6–9, 10–19, 20–29, or all 30 days. For this analysis, the dependent variable was dichotomized into zero days or 1 or more days. The analysis was also performed with number of texting days categorized ordinally; because of the similarity between the two analyses, only the results from the analysis where the dependent variable was dichotomous were presented. The independent variables were age, sex, grade-level, race and/or ethnicity, the type of bans in effect, the length of time since the law enacted, amount of fines, and if delays in full licensure existed. The categorization of the demographic variables is listed in Table 1. States' texting while driving regulations in effect at time the 2013 YRBSS was conducted were categorized into five groups. The first category included states with no texting bans ($n = 1$). The second category included states where only a young driver all cellphone ban existed ($n = 1$); this meant drivers under a certain age could not use a cellphone for any purpose while driving. The third category encompassed states where texting bans were in effect for certain ages (typically 18 or 21 years of age), but no young driver all cellphone bans existed ($n = 2$). The fourth category comprised states with a universal texting ban for all ages ($n = 3$). The fifth category included states with both a universal texting ban and a young driver

Table 1
Characteristics of the 2013 Youth Risk Behavior Surveillance System participants by texting status*

Characteristic	Did not text in the past 30 d ($n = 3793$) n (%)	Texted ≥ one time in the past 30 d ($n = 2424$) n (%)	Total ($n = 6216$) n (%)
Age (y)			
≤15	1311 (34.7)	248 (10.3)	1558 (25.2)
16	1307 (34.6)	681 (28.3)	1988 (32.2)
17	974 (25.8)	1186 (49.3)	2161 (35.0)
18	183 (4.8)	290 (12.1)	473 (7.7)
Missing			36
Sex			
Male	1946 (51.4)	1249 (51.5)	3195 (51.4)
Female	1841 (48.6)	1174 (48.5)	3015 (48.6)
Missing			6
Grade in school			
9th	997 (26.4)	202 (8.4)	1199 (19.4)
10th	1303 (34.6)	461 (19.2)	1764 (28.6)
11th	958 (25.4)	967 (40.3)	1925 (31.2)
12th	513 (13.6)	768 (32.0)	1281 (20.8)
Missing			47
Race/ethnicity			
White	2124 (57.3)	1609 (67.7)	3733 (61.4)
African American	526 (14.2)	190 (8.0)	716 (11.8)
Latino	432 (11.7)	169 (7.1)	601 (9.9)
Asian	96 (2.6)	54 (2.3)	150 (2.5)
Other	528 (14.2)	356 (15.0)	884 (14.5)
Missing			132
Types of state texting bans			
No texting ban	83 (2.2)	63 (2.6)	145 (2.3)
Young driver all cellphone ban only	155 (4.1)	149 (6.2)	304 (4.9)
Texting ban for young drivers but no young driver all cellphone ban	235 (6.2)	231 (9.6)	466 (7.5)
Universal texting ban	348 (9.2)	247 (10.3)	595 (9.6)
Universal texting ban in conjunction with a young driver all cellphone ban	2948 (78.2)	1714 (71.3)	4662 (75.5)
Length of time since law has been enacted			
No law	83 (2.2)	63 (2.6)	145 (2.3)
<1 y	378 (10.0)	298 (12.4)	676 (11.0)
1–2 y	432 (11.5)	371 (15.4)	803 (13.0)
≥2 y	2877 (76.3)	1672 (69.6)	4549 (73.7)
Average state fine			
≤$100	2500 (67.8)	1606 (68.6)	4106 (68.1)
>$100	1187 (32.2)	734 (31.4)	1921 (31.9)
Licensure delay for texting offenses			
Present	1141 (30.3)	473 (19.7)	1615 (26.2)
Absent	2628 (69.7)	1931 (80.3)	4559 (73.8)

* Percentages may not add up to 100% due to rounding.