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Brief Original Report

Prevalence and correlates of cell phone use among Texas drivers

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ABSTRACT

Introduction. Cell phone use while driving restricts peripheral awareness and impairs reaction time. This study assessed the 3-year prevalence of cell phone use (CPU) of drivers and characteristics associated with its use in six cities across Texas, 2011–2013. *Methods.* CPU and driver characteristics were observed among motor vehicles (n = 1280) stopped at major intersections in medical and academic campuses. A multivariable logistic regression model described the association between driver characteristics and CPU. *Results.* The overall prevalence of any CPU was 18.7%. Any type of CPU and talking tended to decline, while texting seemed to increase from 2011 to 2013. CPU was more likely among female drivers (OR = 1.63; 95% CI = 1.21, 2.20), drivers <25 years of age (OR = 4.12; 95% CI = 2.29, 7.39), and drivers without passengers (OR = 4.40; 95% CI = 2.82, 6.88). *Conclusion.* Despite its dangers, CPU remains popular among Texas drivers. CPU and texting bans should target public health campaigns towards female and younger drivers.

Introduction

Cell phone use (CPU), such as texting or talking, while driving impairs peripheral awareness Maples et al., 2008 and reaction time (Strayer et al., 2006; Caird et al., 2008; Yager et al., 2012), increasing the frequency of near-collisions, collisions, and accidents with injuries (Laberge-Nadeau et al., 2003; Seo and Torabi, 2004; Neyens and Boyle, 2007; McEvoy et al., 2007; McEvoy et al., 2005). Visual distraction, such as texting, diverts the drivers' attention from the road and increases crash risk; Klauer et al., 2014 texting while driving was responsible for nearly 16,000 U.S. traffic fatalities between 2001 and 2007 (Wilson and Stimpson, 2010). Despite the dangers of CPU while driving, upwards of 660,000 U.S. drivers may be using their cell phones at any time (Pickrell and Ye, 2010).

National prevalence estimates of CPU of drivers range between 5% and 10%;Pickrell and Ye, 2010; Townsend, 2006; Vera-López et al., 2012 however, this may be underestimating the problem as many U.S. drivers self-report CPU while driving (Braitman and McCartt, 2010). Nearly 40% of all drivers report talking and 13% report texting while driving at least once a week (Braitman and McCartt, 2010). The prevalence of CPU while driving is particularly high among teenage and young adult drivers (Braitman and McCartt, 2010; Cook and Jones, 2011; Harrison, 2011).

Medical and academic campuses have large concentrations of young (20–30 years old), ill, or elderly pedestrians and drivers, who are often unfamiliar with the congested environment. Drivers distracted by cell phones pose a safety threat to pedestrians and motorists in these demanding environments. We assessed the prevalence of CPU among drivers in medical and academic campuses in six major Texas cities between 2011 and 2013, and identified factors associated with CPU.

Materials & methods

This study was conducted in Houston, Dallas, Austin, San Antonio, El Paso, and Brownsville at respective University of Texas medical and academic institutions. The protocol was approved by the Committee for Protection of Human Subjects at the University of Texas Health Science Center.

Observations were conducted on a single October weekday each year from 10:30–11:15 am to avoid lunch and rush hour traffic. Prior to data collection, randomly selected intersections were assessed to ensure freedom of construction issues, non-overlapping traffic, and red light intervals long enough to allow completion of the survey. Two trained data collectors were stationed on the sidewalk corner of each included intersection, which were 3–5 lanes wide. Data collectors observed the first unobstructed eligible vehicle stopped during each red light interval for one randomly selected lane. Ineligible vehicles included emergency, delivery and construction vehicles; motorcycles; and public buses. The two data collectors simultaneously completed a 9-item survey (Burns et al., 2008), recording observations on vehicle type, driver and passenger characteristics,

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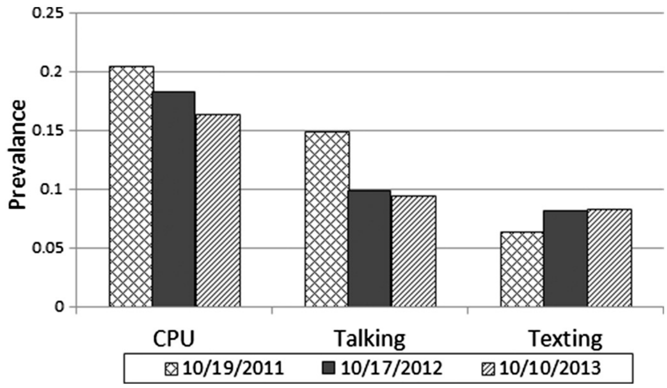

Fig. 1. Prevalence of cell phone use among drivers in major medical and academic campuses in Texas, 2011–2013.

and CPU. CPU was recorded as a driver observed texting, talking with handheld, or talking into a handsfree device. Paired observations of each vehicle increased the probability of observing every survey item during the red light interval. Data collectors within pairs consolidated their individual surveys of each driver into one final survey, resolving discrepancies as a form of quality control.

Statistical analyses were conducted using Stata V.12.1 (StataCorp, College Station, TX). CPU was assessed by subgroups of texting and talking (handheld or handsfree). The prevalence of CPU was calculated across each year and stratified by the type of use (CPU, texting, and talking). Univariate and multivariable logistic regression determined characteristics associated with CPU, texting, and talking, respectively. Backward selection was used to find the most parsimonious model with significant (likelihood-ratio p-value < 0.05) variables.

Results

Of the 1280 observations recorded, drivers were predominately in Houston (70%), male (56%), aged 25–50 years (68%), and traveling without passengers (70%). Fig. 1 shows the prevalence trends of CPU, talking, and texting. CPU tended to decrease from 2011 (20.5%; 95% confidence interval (CI) = 17.1–23.9) to 2012 (18.3%; 95% CI = 14.4–22.1) and to 2013 (16.4%; 95% CI = 12.5–20.3). Talking seemed to decrease, though more sharply, from 2011 (15.0%; 95% CI = 11.9–18.0) to 2012 (9.9%; 95% CI = 6.9–12.9) than 2012 to 2013 (9.5%; 95% CI = 6.4–12.6). Texting appeared to increase from 2011 (6.4%; 95% CI = 4.3–8.4) to 2012 (8.2%; 95% CI = 5.5–10.9) then remained steady in 2013 (8.4%; 95% CI = 5.4–11.3).

Female drivers had higher odds of CPU and texting than males (Table 1). The odds of talking did not differ significantly by gender. Compared to older drivers, younger and middle age drivers had greater odds of CPU. The youngest drivers had the highest odds of CPU, texting, and talking. However, the odds of talking on a cell phone did not differ significantly between the youngest and middle age groups (OR = 1.20; 95% CI = 0.69–2.09). Finally, unaccompanied drivers had increased odds of CPU, texting, or talking compared to accompanied drivers.

Discussion

The prevalence of CPU (18.7%) in this study was higher than national data (9%) (Pickrell and Ye, 2010). This may be explained by differences in location, years of observation, and sampling schemes. The national study, conducted until 2010, included vehicles stopped at intersections, exiting freeways, and on other surface streets in rural and urban areas; Pickrell and Ye, 2010 while, this study included vehicles stopped at intersections in medical and academic campuses. Similar to previous reports, this study found the prevalence of talking appeared to decrease slightly while texting seemed to increase over a three year period (Pickrell and Ye, 2010; Young et al., 2010). This study further supports previous studies showing that female and younger drivers were more likely to engage in CPU than males and older drivers (Pickrell and Ye, 2010; Braitman and McCartt, 2010; Cook and Jones, 2011; Harrison, 2011). The high prevalence of CPU in highly congested vehicle and pedestrians areas across Texas supports banning driver CPU in academic and medical campuses to increase safety.

Table 1
Characteristics of randomly sampled vehicles and factors associated with cell phone use among drivers in major medical and academic campuses in Texas, 2011–2013.

	2011 (n = 537) n (%)	2012 (n = 396) n (%)	2013 (n = 347) n (%)	Total (n = 1280) n (%)	CPU OR[a] (95% CI)	Texting OR[a] (95% CI)	Talking OR[a] (95% CI)
City							
Houston	378 (70.4)	272 (68.7)	246 (70.9)	896 (70.0)			
Austin	60 (11.2)	45 (11.3)	11 (3.3)	116 (9.0)			
Brownsville	–	–	15 (4.3)	15 (1.2)			
Dallas	39 (7.2)	49 (12.4)	30 (8.6)	118 (9.2)			
San Antonio	60 (11.2)	30 (7.6)	30 (8.6)	120 (9.4)			
El-Paso	–	–	15 (4.3)	15 (1.2)			
Vehicle type[b]							
2 or 4 door car	266 (49.6)	193 (48.9)	194 (55.9)	653 (51.1)			
Minivan/SUV	200 (37.2)	139 (35.3)	105 (30.3)	444 (34.7)			
Pickup truck	71 (13.2)	62 (15.8)	48 (13.8)	181 (14.2)			
Driver gender[b]							
Male	314 (58.6)	208 (52.7)	189 (54.5)	711 (55.6)	Ref	Ref	Ref
Female	222 (41.4)	187 (47.3)	158 (45.5)	567 (44.4)	1.63 (1.21–2.20)	2.22 (1.42–3.47)	1.27 (0.89–1.80)
Driver age[b]							
<25 years	38 (7.1)	36 (9.1)	33 (9.5)	107 (8.4)	4.12 (2.29–7.39)	5.76 (2.39–13.86)	2.41 (1.20–4.85)
25–50 years	372 (69.4)	274 (69.4)	218 (62.8)	864 (67.6)	2.40 (1.54–3.73)	2.72 (1.29–5.77)	2.00 (1.20–3.34)
>50 years	126 (23.5)	85 (21.5)	96 (27.7)	307 (24.0)	Ref	Ref	Ref
Driver seatbelt use[b]							
No	23 (4.5)	12 (3.1)	9 (2.8)	44 (3.6)			
Yes	487 (95.5)	380 (96.9)	317 (97.2)	1184 (96.4)			
Passengers[b]							
No	378 (71.6)	282 (73.2)	220 (63.8)	880 (70.0)	4.40 (2.82–6.88)	3.21 (1.68–6.14)	4.46 (2.53–7.87)
Yes	150 (28.4)	103 (26.8)	125 (36.2)	378 (30.0)	Ref	Ref	Ref

Abbreviations: CPU, cell phone use; CI, confidence interval.
[a] Odds ratios adjusted for other variables included in the model: driver gender, driver age, and presence of passengers.
[b] Missing data: vehicle type, n = 1; sex of driver, n = 2; age of driver, n = 2; driver seatbelt use, n = 52; passengers, n = 22.

The majority of observations occurred in Houston, limiting the generalizability to other campuses. Although Houston drivers may not represent the CPU habits of drivers in other cities, the prevalence of CPU did not differ significantly between locations when city was added to the model. Additionally, the driver characteristics were similar across locations. Data were not collected in El Paso and Brownsville every year due to limited data collector availability; thus generalization of findings should be done carefully.

The timing and location of data collection likely excluded technology-savvy, adolescent drivers and rush hour commuters. Data were collected on an October weekday at mid-morning, thus teen drivers were likely at school unless they were visiting the medical center for health-related concerns. The drivers observed in this study were likely more representative of a cross-section of the local population, employees, and visitors less familiar with the area. Thus, the reported prevalence of CPU may underestimate the prevalence during peak driving hours or in areas with a high volume of younger drivers.

The prevalence of CPU among drivers could be misestimated given the difficulty in identifying handsfree talking. Data collectors received training, but may have incorrectly recorded handsfree talking for drivers who were singing or talking to passengers. Accuracy of observing handsfree talking was probably aided by having two data collectors observe each vehicle and reach a consensus on driver handsfree usage. Finally, this study, like previous studies, did not estimate the prevalence of CPU among moving vehicles.

Cell phone use remains prevalent among drivers in Texas academic and medical campuses. Many states have passed legislation prohibiting CPU while driving and the Texas state legislature is considering a number of measures to combat CPU by drivers (Anon, 2012). Both Austin and San Antonio had bans on texting while driving, enacted in 2010; yet, the prevalence of texting in these cities did not differ from others in the study. Females and younger drivers appear to be more likely to engage in CPU, thus public safety campaigns should target these groups. Future legislation should incorporate public health campaigns to stop CPU while driving and reduce traffic related injuries.

Contributors

ALB and RSD conceived the study and all authors were involved in the data collection and data entry. MLW, ALB, and IM performed analysis and prepared tables and figures. All authors were involved in the interpretation of data. MLW, ALB, and RSD prepared the first draft and all authors participated in revising and approving the final version.

Conflict of interest

The authors declare that there are no conflicts of interest.

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