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Adults 65 and older use potentially distracting electronic devices while driving

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To the Editor

The extent to which older adults use technological devices while driving is understudied. Currently, there are 35 million adults over the age of 65 years who are licensed drivers in the United States (U.S.)¹ and this number is expected to rise to more than 40 million by 2020.¹ In a 2007 report, it was estimated that a quarter of all crashes in the U.S. is related to distracted driving due to interaction with communication devices, entertainment systems, etc.² Despite an increase in the number of older drivers¹ and in crash rates due to distracted driving,² research has not focused on older adults and distracted driving as related to the use of electronic devices³. The purpose of this study is to determine the prevalence and frequency of technology usage while driving in a sample of older adults.

Methods

Participants enrolled in a study that examined factors associated with driving performance among older adults (R01-AG043434) at Washington University in Saint Louis School of Medicine. Participants met these inclusion criteria: at least 65 years of age, speak English, currently drive at least once per week, has a valid driver's license, does not require adaptive

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equipment to drive, and cognitively normal as indicated by a Clinical Dementia Rating (CDR)⁴ of 0 determined at their yearly clinical assessment. Each participant completed a general physical and neurological examination, health and medication histories, a Mini-Mental State Examination (MMSE)⁵ at their clinical assessment, and tests of driving and additional cognitive assessment at the time of their annual driving evaluation. This study was approved by the Washington University Institutional Review Board. The Electronic Drive Survey (EDS) was administered verbally at the time of cognitive assessment during their annual driving evaluation. The survey consists of 37 questions and evaluates the type and degree of electronic device usage while driving. The survey is separated into six categories, which include use of: a radio, dashboard controls, global positioning system (GPS), cellular telephone (including hands-free), text messaging, and smart phone capable phones (for e-mailing purposes). Each category contains an initial “yes or no” question to determine if the participant engages in the activity; within the category are questions responded to on a three point Likert scale (never, sometimes, and always). *See* Table 1.

Demographic characteristics were calculated using descriptive statistics. Percentage of responses and 95% confidence intervals were calculated for all 37 questions of the EDS. Logistic regression was conducted for the six category-of-use questions with binary responses (e.g. yes or no) while age, education and gender were included in the models as predictors. Differences in age and education on frequency of use for the 31 remaining questions were calculated using a one-way analysis of variance (ANOVA), where the categorical response (never=0, sometimes=1, always=2) was the independent variable, while age and education were dependent variables. Chi-square statistics were generated to determine whether there were gender differences in responses to the 31 questions. All statistical analyses were performed using SPSS version 21 (Chicago, Illinois, USA).

Results

There were 100 participants who completed the EDS. Participants mean (SD) age was 73.4 $\pm$ (4.7) years, about one-half were women (51%), their mean education level was 16.1 (2.6) years, they were all cognitively normal (MMSE 29.4 $\pm$ 1; CDR 0 $\pm$ 0), and were predominantly Caucasian (91%). Table 1 presents responses for all 37 questions of the EDS. While driving, 91% of participants used the radio, 79% adjusted dashboard controls, 56% used a cellular phone, 39% used a GPS, 3% reported texting while driving, and 2% e-mail with a smart phone while driving. Age was a significant predictor of using a cellular phone while driving and owning a smart phone; with younger age being associated with cellular phone use ($t(98) = 2.24, p = .027$) and ownership of smart phones ($t(98) = 3.32, p = .001$). Women were more likely than men to own a smart phone ($(X^2(1, 100) = 4.84, p = <.028)$).

Discussion

To our knowledge, this survey is the first to capture the use of several electronic devices among older adults (≥ 65 years) while driving. We found that older adults are engaging with a variety of potentially-distracting electronic devices while driving. Given the hazards of distracted driving found in other research^{2,6,7,8,9}, together with the frequency of distracted driving activities due to in-car technologies found in this study, electronic device use may be

placing older adults and society at increased risk for motor vehicle crashes. The benefits and risks of these devices in a growing aging population needs further study.

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References

1. Older driver program five-year strategic plan 2012–2017. Washington (DC): National Highway Traffic Safety Administration; 2010 Dec. DOT HS 811 432. Technical Report (online). Available at www.nhtsa.gov/staticfiles/nti/pdf/811432.pdf [Accessed November 24, 2014]
2. Young, K.; Regan, M. Driver distraction: A review of the literature. In: Faulks, IJ.; Regan, M.; Stevenson, M., et al., editors. Distracted driving. Sydney, NSW: Australasian College of Road Safety; 2007. p. 379-405.
3. Ling R, Bertel TF, Sundsoy PR. The socio-demographic of texting: An analysis of traffic data. New Media Soc. 2012; 14(2):281–298.
4. Morris JC. The clinical dementia rating (CDR): Current version and scoring rules. Neurology. 1993; 43:2412–2414. [PubMed: 8232972]
5. Folstein MF, Folstein SE, McHugh PR. "Mini-Mental State": A practical method of grading the cognitive state of patients for the clinician. J Psychiatr Res. 1975; 12(3):189–198. [PubMed: 1202204]
6. Asbridge M, Brubacher JR, Chan H. Cell phone use and traffic crash risk. Int J Epidemiol. 2013; 42:259–267.
7. [Accessed on September 29, 2014] The dangers of texting while driving. Federal communications commission (online). Available at; <http://www.fcc.gov/guides/texting-while-driving>
8. Ball KK, Beard BL, Roenker DL, et al. Age and visual search: expanding the useful field of view. J Opt Soc Am [A]. 1988; 5(12):2210–2219.
9. Pond RWH, Brouwer WH, vanWolffelaar PC. Age differences in divided attention in a simulated driving task. J Gerontol. 1988; 43(6):151–156.

Table 1

Responses to the Electronic Device Usage Survey

EDS Question	% Yes [95% C.I.]	Never	Sometimes	Always
Do you use the radio while driving?	91 (91%) [0.84, 0.95]	0 (0.0%) [NA]	37 (40.7%) [0.31, 0.51]	54 (59.3%) [0.49, 0.69]
Do you listen to the radio while driving during the day?				
Do you listen to the radio while driving during the night?		9 (9.9%) [0.05, 0.18]	35 (38.5%) [0.29, 0.49]	47 (51.6%) [0.42, 0.62]
Do you listen to the radio while driving during high traffic conditions either a highway or city and/or marked construction zone?		10 (11.0%) [0.06, 0.19]	37 (40.7%) [0.31, 0.51]	44 (48.4%) [0.38, 0.58]
Do you tune the radio while driving during the day?		0 (0.0%) [NA]	37 (40.7%) [0.31, 0.51]	54 (59.3%) [0.49, 0.69]
Do you listen to the radio while driving during the night?		9 (9.9%) [0.05, 0.18]	35 (38.5%) [0.29, 0.49]	47 (51.6%) [0.42, 0.62]
Do you tune the radio while driving during high traffic conditions either a highway or city and/or marked construction zone?		64 (70.3%) [0.60, 0.79]	25 (27.5%) [0.19, 0.37]	2 (2.2%) [0.00, 0.08]
Do you adjust dashboard controls while driving?	79 (79%) [0.70, 0.86]			
while driving during the day?		2 (2.5%) [0.00, 0.09]	77 (97.5%) [0.91, 0.99]	0 (0.0%) [NA]
while driving the night?		6 (7.6%) [0.04, 0.16]	73 (92.4%) [0.91, 0.96]	0 (0.0%) [NA]
Do you adjust dashboard controls while driving during high traffic conditions either a highway or city and/or marked construction zone?		25 (31.6%) [0.22, 0.43]	54 (68.4%) [0.57, 0.78]	0 (0.0%) [NA]
Do you use a GPS while driving?	39 (39%) [0.46, 0.65]			
How often do you look at a GPS to navigate while driving during the day?		8 (20.5%) [0.11, 0.35]	29 (74.4%) [0.59, 0.85]	2 (5.1%) [0.01, 0.17]
How often do you look at a GPS to navigate while driving during the night?		13 (33.3%) [0.21, 0.49]	24 (61.5%) [0.46, 0.75]	2 (5.1%) [0.01, 0.17]
How often do you look at a GPS to navigate while driving high traffic conditions either a highway or city and/or marked construction zone?		20 (51.3%) [0.36, 0.36]	18 (46.2%) [0.32, 0.61]	1 (2.6%) [0.00, 0.13]
How often do you program a GPS while driving during the day?		32 (82.1%) [0.67, 0.91]	7 (17.9%) [0.09, 0.33]	0 (0.0%) [NA]
How often do you program a GPS while driving during the night?		34 (87.2%) [0.73, 0.96]	5 (2.8%) [0.06, 0.27]	0 (0.0%) [NA]
How often do you program a GPS while driving during high traffic conditions either a highway or city and/or marked construction zone?		35 (89.7%) [0.76, 0.96]	4 (0.3%) [0.04, 0.24]	0 (0.0%) [NA]
Do you use a cell phone while driving?	56 (56%) [0.46, 0.65]			
Is it a hands-free phone?	25 (44.6%) [0.32, 0.58]			
while driving during the day?		4 (7.11%) [0.03, 0.17]	51 (91.1%) [0.81, 0.96]	1 (1.8%) [0.00, 0.10]
while driving the night?		13 (23.2%) [0.14, 0.36]	42 (75.0%) [0.62, 0.84]	1 (1.8%) [0.00, 0.10]

EDS Question	% Yes [95% C.I.]	Never	Sometimes	Always
while driving on unfamiliar roads/areas?		26 (46.4%) [0.34, 0.59]	29 (51.8%) [0.39, 0.64]	1 (1.8%) [0.00, 0.10]
while driving on familiar roads/areas?		3 (5.4%) [0.02, 0.15]	52 (92.9%) [0.83, 0.97]	1 (1.8%) [0.00, 0.10]
while driving during high traffic conditions either on the highway and/or construction zones?		30 (53.6%) [0.47, 0.66]	24 (42.9%) [0.31, 0.56]	2 (3.6%) [0.01, 0.12]
because you needed directions or assistance navigating?		37 (66.1%) [0.53, 0.77]	19 (33.9%) [0.23, 0.47]	0 (0.0%) [NA]
because it was due to something very important?		10 (17.9%) [0.10, 0.30]	40 (71.4%) [0.59, 0.82]	6 (10.7%) [0.05, 0.21]
How often do you pull over to use a phone?		13 (23.2%) [0.14, 0.36]	40 (71.4%) [0.59, 0.82]	3 (1.8%) [0.02, 0.15]
How often do you use a phone while driving and stopped at a stop light?		10 (17.9%) [0.11, 0.26]	45 (80.4%) [0.68, 0.89]	1 (1.8%) [0.00, 0.10]
Do you text message?	17 (17%) [0.11, 0.26]			
text message while driving during the day?		14 (82.4%) [0.59, 0.94]	3 (17.6%) [0.06, 0.41]	0 (0.0%) [NA]
text message while driving during the night?		16 (94.1%) [0.73, 0.99]	1 (5.9%) [0.01, 0.27]	0 (0.0%) [NA]
Do you have a smart phone?	50 (50%) [0.40, 0.60]			
email while driving during the day?		15 (88.2%) [0.66, 0.97]	2 (11.8%) [0.03, 0.34]	0 (0.0%) [NA]
email while driving during the night?		15 (88.2%) [0.66, 0.97]	2 (11.8%) [0.03, 0.34]	0 (0.0%) [NA]
email while driving during high traffic conditions either a highway or city and/or marked construction zone?		15 (88.2%) [0.66, 0.97]	2 (11.8%) [0.03, 0.34]	0 (0.0%) [NA]

NA= not applicable

C.I.= Confidence Interval

* unadjusted