Screening and Brief Advice to Reduce Adolescents' Risk of Riding With Substance-Using Drivers

JOHN R. KNIGHT, M.D.,^{a,b,c,*} LADISLAV CSEMY, PH.D.,^{d,e} LON SHERRITT, M.P.H.,^{a,b,c} OLGA STAROSTOVA, M.A.,^{d,e,f} SHARI VAN HOOK, M.P.H.,^{a,b} JANINE BACIC, M.S.,^g CAROLINE FINLAY, B.A.,^b JESSICA TAUBER, B.S.,^b TRACI BROOKS, M.D.,^{h,i,j} ROBERT KOSSACK, M.D.,^k JOHN W. KULIG, M.D., M.P.H.,^l JUDITH SHAW, RN-C, M.P.H.,^{m,n,o} & SION KIM HARRIS, PH.D.,^{a,b,c}

^aDepartment of Pediatrics, Harvard Medical School, Boston, Massachusetts

^bDepartment of Medicine, Boston Children's Hospital, Boston, Massachusetts

^cDivision of Adolescent/Young Adult Medicine, Boston Children's Hospital, Boston, Massachusetts

^dNational Institute of Mental Health, Topolová 748, 250 67, Klecany, Czech Republic

^eCentre for Evaluation, Prevention and Research of Substance Abuse, Prague, Czech Republic

^fThe Faculty of Humanities, Charles University, U Kříže 8158 00 Prague 5 Jinonice, Czech Republic

^gCenter for Evidence Synthesis in Health, School of Public Health, Brown University, Providence, Rhode Island

^hDepartment of Pediatrics, Cambridge Health Alliance, Cambridge, Massachusetts

ⁱTeen Health Center, Cambridge Rindge and Latin High School, Cambridge, Massachusetts

^jTeen Health Center, Somerville High School, Somerville, Massachusetts

^kDepartment of Pediatrics, Reliant Medical Group, Worcester, Massachusetts

^lDepartment of Pediatrics, Tufts Medical Center-Floating Hospital for Children, Boston, Massachusetts

^mVermont Child Health Improvement Project, University of Vermont College of Medicine, Burlington, Vermont

ⁿMilton Family Practice, Milton, Vermont

^oColchester Family Practice, Road, Colchester, Vermont

ABSTRACT. Objective: Alcohol- and drug-related car crashes are a leading cause of death for adolescents in the United States. This analysis tested the effects of a computer-facilitated Screening and Brief Advice (cSBA) system for primary care on adolescents' reports of driving after drinking or drug use (*driving*) and riding with substance-using drivers (*riding*). **Method:** Twelve- to 18-year-old patients ($N = 2,096$) at nine New England pediatric offices completed assessments only during the initial 18-month treatment-as-usual (TAU) phase. Subsequently, the 18-month cSBA intervention phase began with a 1-hour provider training and implementation of the cSBA system at all sites. cSBA included a notebook-computer with self-administered screener, immediate scoring and feedback, and 10 pages of scientific information and true-life stories illustrating substance-related harms. Providers received screening results, "talking points" for 2 to 3 minutes of counseling, and a Contract

for Life handout. Logistic regression with generalized estimating equations generated adjusted relative risk ratios (aRRR) for past-90-day driving and riding risk at 3- and 12-month follow-ups, controlling for significant covariates. **Results:** We found no significant effects on driving outcomes. At 3 months, cSBA youth were less likely than TAU to report riding with a drinking driver (aRRR = 0.70, 95% CI [0.49, 1.00]), and less likely to report riding with a driver who had used cannabis or other drugs (aRRR = 0.46, 95% CI [0.29, 0.74]). The effect was even greater (aRRR = 0.34, 95% CI [0.16, 0.71]) for riding with drinking drivers who were adult family members. All effects dissipated by 12-month follow-up. **Conclusions:** Screening and pediatrician brief advice shows promise for reducing adolescents' risk of riding with substance-using drivers. (*J. Stud. Alcohol Drugs*, 79, 611–616, 2018)

THOUSANDS OF ADOLESCENTS in the United States die in motor vehicle crashes each year, and alcohol and drug use are major contributors (DuPont, 2011; Rehm et al., 2009). In 2015, one in four fatally injured teen drivers

(26%) had a blood alcohol concentration (BAC) greater than .01 g/dL, and one in five (21%) had a BAC greater than .08 g/dL (National Highway Traffic Safety Administration [NHTSA], 2017a). Among younger motor vehicle fatalities (ages 14 and younger), one in six (17%) were driven by an alcohol-impaired driver (NHTSA, 2017b). In recent years, the rates of adolescents reporting recent (past 2 weeks) driving after using cannabis (12%) and riding with a driver who had used cannabis (19%) have steadily increased and now surpass alcohol-involved driving (9%) and riding (17%) rates (O'Malley & Johnston, 2013). Therefore, it is important to identify strategies that can effectively identify and mitigate these potentially fatal risky behaviors.

Youth should be screened for riding with an alcohol- or drug-using driver (hereafter, "riding") beginning at age

Received: August 14, 2017. Revision: February 23, 2018.

This study was supported by National Institute on Drug Abuse Grant R01DA018848. Other support was provided by National Institute on Alcohol Abuse and Alcoholism Grant K07 AA013280 (to John R. Knight) and Maternal and Child Health Bureau Grants T20MC07462 (to John R. Knight and Shari Van Hook) and T71NC0009 (to Sion Kim Harris). No authors have any relevant financial relationships with industry. No authors have any other potential conflicts of interest to report. Trial Registration: Identifier Number NCT00592956, www.clinicaltrials.gov.

*Correspondence may be sent to John R. Knight at 15 Frothingham Street, Milton, MA 02186, or vial email at: john.knight@childrens.harvard.edu.

12 years (Ewing et al., 2015) and for alcohol- and drug-involved driving (hereafter “driving”) at age 15 when driving usually begins. The CRAFFT, a widely recommended assessment developed specifically for use in pediatric medical settings, offers a brief screen for driving/riding risk (Knight et al., 2002). CRAFFT is a mnemonic acronym composed of the first letters of the key words in its six questions. The “C” question is, “Have you ever ridden in a CAR driven by someone (including yourself) who was ‘high’ or had been using alcohol or drugs?”

Several recent studies have validated substance use screens that only include questions about the frequency of past-12-months use (Clark et al., 2016; Levy et al., 2016a). A recent American Academy of Pediatrics Clinical Report recommends this approach (Levy et al., 2016b), but limiting screening to an assessment of patients’ personal use results in a lost opportunity to identify and intervene with those at risk because of riding with a substance-using driver, regardless of their own substance use.

To inform this discussion, we performed a secondary analysis of data from a 2012 study testing a computer-facilitated screening and pediatrician brief advice (cSBA) system based on the CRAFFT (Harris et al., 2012). Patients self-administered the screen on a computer in a private location before the physician visit, immediately received their CRAFFT score and risk level, and viewed 10 pages presenting science and true-life stories illustrating the health risks of alcohol and drug use. The system produced a report for the pediatrician with the screening results and a brief list of “talking points” designed to prompt 2 to 3 minutes of counseling.

All patients received a printed copy of the Contract for Life (Students Against Destructive Decisions [SADD], 2016), which asks adolescents never to drive after substance use or accept a ride from a substance-using driver. Instead, they agree to call their parent(s) for a safe ride home. Parents, in turn, agree to provide safe and sober transportation home and postpone any discussion until the following day. Pediatricians were instructed to ask all patients to discuss the Contract for Life with their parent(s) and to follow up with the provider if additional discussion was needed. This strategy preserved the confidentiality of high-risk patients while serving as a prevention strategy for both high- and low-risk patients.

The objective of this analysis was to examine the effect of cSBA at 3- and 12-month follow-ups on adolescents’ reports of substance-involved driving/riding and, specifically, riding with a substance-using adult family member.

Method

This was a secondary analysis of data collected during 2005–2009. Detailed methods are published elsewhere (Harris et al., 2012). Briefly, we conducted the study in nine primary care offices in New England. We compared

cSBA to treatment as usual (TAU) in a quasi-experimental comparative effectiveness trial in which each site served as its own historical control group. At the start of the study, we instructed providers to continue their usual standard of care, and for the next 18 months we recruited and tested the TAU group. At crossover, we held a 1-hour provider training that comprised a demonstration of the cSBA system; a review of screening reports for low-, medium-, and high-risk patients; and a video that showed how to use the talking points and Contract for Life document in brief counseling. We then initiated the cSBA computer system at all sites and recruited and tested the cSBA group over the final 18 months.

Participants were 12- to 18-year-old patients arriving for routine primary care visits who provided informed assent/consent. They completed the baseline assessment battery before the provider visit and identical assessments at 3 and 12 months after the visit. They received a \$15 merchandise certificate after completing each measurement. The Institutional Review Boards of Boston Children’s Hospital and all other sites approved the study protocol.

Measures

The measures have been previously described in detail (Harris et al., 2017). Participants completed a computer self-administered questionnaire assessing demographics; visit/provider characteristics; substance use by peers, siblings, and parents (scales derived from the Personal Experience Inventory; Winters, 1993); and a branching questionnaire assessing past-90-day driving and riding risks for alcohol and cannabis or other drugs. Only participants ages 16 years or older received the driving risk items. Participants indicating any riding were asked follow-up questions to determine if they rode with a driver who was age 21 or older and lived in the home. Youth answering affirmatively were categorized as riding with an adult family member. To assess for historical confounding within this asynchronous study design, we measured differences in the frequency of past-year exposure to substance use–related messages received outside of the study intervention and found no differences.

Data analyses

We conducted all analyses using SUDAAN® v.11.0 with site as the nest variable to appropriately account for correlated error arising from our multisite cluster-sampling design. We used an “intent-to-treat” approach, analyzing cSBA adolescents regardless of whether they reported receiving provider advice. We used chi-square tests for categorical variables and *t* tests for continuous variables to assess baseline equivalence of the two groups and to compare characteristics of those retained versus lost to follow-up. We dichotomized race (White non-Hispanic vs. other), parents in home (two vs. other), parent education level ($\geq$ college

graduate vs. other), and type of visit (well visit vs. other) to ensure adequate cell sizes. All analyses of driving outcomes included data only for those ages 16 years or older ($N = 1,068$, 51% of total sample).

Because even one driving or riding instance could result in tragedy, we computed risks for any driving or riding with a drinking or cannabis/other-drug-using driver by collapsing responses into *none/any*. For analysis of the intervention effect at 3- and 12-month follow-ups, we used logistic regression modeling with generalized estimating equations to compute adjusted relative risk ratios (aRRR) for cSBA compared with TAU, controlling for baseline driving and riding variables, other identified baseline between-group differences, and the multisite sampling design.

Model-based missing data imputation was conducted to evaluate potential response bias in our follow-up effect estimates. Estimates of effect using the imputed data set were generally slightly stronger than the non-imputed, and our findings did not change, so we report non-imputed results.

Results

Sample characteristics

A total of 2,096 of 2,435 eligible patients (86.1%) completed baseline assessments. The mean (SD) age was 15.8 (2.0) years, 58.2% were girls, 64.6% were White/non-Hispanic, 11.0% were Hispanic, 7.2% were Asian/non-Hispanic, 10.4% were Black/non-Hispanic, and 6.9% self-categorized as other. At 3- and 12-months follow-up, retention rates for TAU were 70.7% and 72.4%, respectively, and for cSBA 74.0% and 75.1%, respectively. Compared with those retained at 3 months, noncompleters were older ($M_{\text{age}} = 15.8$ vs. 15.6, $F = 10.4$, $p < .01$); less likely to be White non-Hispanic (54% vs. 68%), $\chi^2(1) = 41.9$, $p < .01$; and more likely to come from a single-parent household (38% vs. 28%), $\chi^2(1) = 181$, $p < .01$; to have ever used alcohol (42% vs. 36%), $\chi^2(1) = 5.5$, $p < .01$ or cannabis (28% vs. 20%) $\chi^2(1) = 19.4$, $p < .01$; and to report having a substance-using parent (19% vs. 14%); $\chi^2(1) = 7.4$, $p < .01$. We found the same differences between 12-month completers and noncompleters. However, the profiles of noncompleters did not differ between cSBA and TAU.

Driving after drinking or drug use

At baseline, 4.7% of youth ages 16 years old and older reported past-90-days driving after drinking, 5.2% after cannabis/other drug use, and 8.9% after alcohol or drug use.

Riding with a substance-using driver

At baseline, 22.4% of youth (all ages) reported past-90-days riding with a drinking driver, 17.8% with a cannabis/

drug-using driver, and 30.7% with a driver using alcohol or drugs. The TAU group had a significantly higher baseline rate compared with cSBA of reporting riding with a driver who had used cannabis/other drugs (Table 1).

Nearly 1 in 10 (8.2%) reported being driven in the past 90 days by an adult family member who had been drinking, 1.8% by an adult family member who had been using drugs, and 9.3% by an adult family member who had used alcohol or drugs.

Among youth who reported any riding, 44.2% had not used any substances themselves during the past 12 months.

Intervention effect for driving

There were no significant intervention effects on driving outcomes at either 3- or 12-month follow-ups, likely because of small numbers (Table 1).

Intervention effect for riding

Interestingly, past-90-day riding rates showed substantial drops from baseline to follow-up in both cSBA and TAU. After adjustment for baseline riding and other covariates, cSBA youth had, compared with TAU, a 30% lower risk of riding with a drinking driver and 54% lower risk of riding with a driver using drugs at the 3-month follow-up, but the effects dissipated by 12 months (Table 1). The apparent effect size at 12 months for alcohol (19%), however, may warrant further testing in a larger sample.

Intervention effect for riding with substance-using adult family member

Similarly, in adjusted analysis, we found a 66% lower risk at 3 months for cSBA compared with TAU of riding in a car with an adult family member who had been drinking. This effect dissipated by the 12-month follow-up. For riding with an adult family member who had been using cannabis/other drugs, there were too few reports to draw any meaningful conclusion.

Discussion

This study shows that a brief primary care counseling intervention that includes the Contract for Life is a promising strategy to reduce the short-term risk of adolescents riding with a substance-using driver. The effect sizes of 30% and 54% for alcohol and drug use, respectively, required only a few minutes of clinician time. We found an even larger short-term effect when the driver in question was an adult family member.

Unfortunately, all effects dissipated by the 12-month follow-up, consistent with prior studies of brief interventions in primary care, which found that effect sizes tend to be

TABLE 1. Unadjusted group prevalence rates and adjusted relative risk ratios (aRRRs) for past-90-day driving and riding risk behaviors at baseline and 3- and 12-month follow-ups

Variable	TAU n/N (%)	cSBA n/N (%)	aRRR [95% CI] ^a	p
Drove after drinking (among ≥16-year-olds)				
Baseline	35/667 (5.2)	24/591 (4.1)	1.05 [0.57, 1.92]	.71
3 months	8/451 (1.8)	6/459 (1.3)	0.77 [0.25, 2.37]	.64
12 months	15/468 (3.2)	10/442 (2.3)	1.00 [0.64, 1.57]	.80
Drove after using cannabis or other drugs (among ≥16-year-olds)				
Baseline	23/667 (3.4)	42/591 (7.1)	0.79 [0.44, 1.40]	.48
3 months	14/451 (3.1)	8/459 (1.7)	0.63 [0.25, 1.63]	.34
12 months	18/468 (3.8)	14/442 (3.2)	1.01 [0.36, 2.85]	.84
Rode with any driver who had been drinking				
Baseline	278/1,068 (26.0)	192/1028 (18.7)	0.84 [0.65, 1.07]	.20
3 months	103/755 (13.7)	60/761 (7.9)	0.70 [0.49, 1.00]	.05
12 months	109/773 (14.4)	79/772 (10.3)	0.81 [0.59, 1.11]	.26
Rode with an adult family member who had been drinking				
Baseline	101/1,068 (9.5)	71/1028 (6.9)	0.77 [0.56, 1.06]	.11
3 months	37/775 (4.9)	11/761 (1.4)	0.34 [0.16, 0.71]	.001
12 months	33/773 (4.4)	28/772 (3.5)	0.88 [0.51, 1.50]	.62
Rode with any driver who had used cannabis or other drugs				
Baseline	228/1,068 (21.4)	145/1028 (14.1)	0.75 [0.58, 0.98]	.05
3 months	82/755 (10.9)	43/761 (5.7)	0.46 [0.29, 0.74]	.005
12 months	80/773 (10.6)	64/772 (8.4)	0.88 [0.61, 1.29]	.36
Rode with an adult family member who had used cannabis or other drugs				
Baseline	27/1,068 (2.5)	10/1028 (1.0)	0.47 [0.22, 1.02]	.06
3 months	9/755 (1.2)	4/761 (0.5)	0.54 [0.15, 1.87]	.19
12 months	6/773 (0.8)	6/772 (0.8)	1.29 [0.34, 4.84]	.71

Notes: TAU = treatment as usual; cSBA = computer-facilitated screening and brief advice; CI = confidence interval.

^aAll baseline aRRR models adjusted for baseline past-12-month substance use, age, gender, race, and parent education, with precision estimates adjusted for the multisite sampling design. All 3- and 12-month follow-up models also included baseline driving/riding variables as control variables.

strongest at earliest follow-up points, with decay in intervention effects over time (O'Donnell et al., 2014). These results highlight the need for future research to identify practical strategies for use in primary care that reinforce and extend brief intervention effects over time.

The sizeable drop of approximately 50% in riding for the TAU group could have been a result of assessment reactivity (Walters et al., 2009) or a Hawthorne effect of being observed (Murray et al., 1988). However, we also found that about one third of TAU pediatricians advised their patients about driving/riding-related risk behaviors, which was about half the rate reported in the cSBA group. Yet, the drop in the cSBA group was significantly larger. A recent systematic review and meta-analysis of brief alcohol interventions for drinking and driving among youth (Steinka-Fry et al., 2015) identified 12 studies that tested an alcohol intervention of 5 hours or less duration over a 1-month period among 11- to 25-year-olds. Overall, they found a modest (0.15 *SD*) improvement but significant effect on drinking and driving that was primarily correlated with a post-intervention reduction

in heavy use of alcohol. We could find no published studies examining the effects of brief interventions on riding with a substance-using driver (Williams et al., 2007), despite a number of reports showing that this is a serious concern among youth (Beck et al., 2010; Bell et al., 2005; Cartwright & Asbridge, 2011).

A number of potential study limitations should be noted. First, these data were collected in 2005–2009 and may not reflect current adolescent behavior. The assessment battery relied on adolescent self-report, which could introduce recall or social-desirability bias. Although we were not able to identify any reports assessing the reliability of adolescent self-report of riding/driving behaviors, research suggests that computer self-administered confidential questionnaires are associated with higher disclosure of sensitive behaviors (Beck et al., 2014; Newman et al., 2002). To avoid making parents secondary subjects, we did not ask participants directly whether it was a parent who was driving the car after drinking or drug use. In some instances it could have been an over-21 sibling. However, in a previous study, we found a

significant correlation between adult family member driving after substance use and other items that measured parents' substance use (e.g., "I am worried about my parent(s) drinking/drug use"; Harris et al., 2017). Our measure of riding with a driver under the influence of "cannabis or other drugs" does not allow differentiation of specific drugs and required adolescents to subjectively judge what the driver had been using. This study used a quasi-experimental asynchronous comparison group design, which can be subject to historical confounding. Future studies should be randomized trials. Additionally, although we gave all patients the Contract for Life, we do not know how often family members actually received these or made agreements to request and provide safe transportation home. Finally, we did not ask about drivers' licenses, which would have given a more accurate denominator for our driving rates.

Study strengths included a large and diverse sample from a variety of primary care settings over several U.S. states, and testing an intervention approach that required minimal pediatrician time and preserved the confidentiality of youth at risk.

This study provides initial evidence supporting pediatrician screening and brief counseling for riding risk. It also highlights the importance of screening youth for riding with substance-using drivers. An updated version of the CRAFFT screener (CRAFFT 2.0) begins with simple questions regarding frequency of use during the past 12 months and then uses a skip-pattern to maximize efficiency (Harris et al., 2016). Those who report no use answer the CAR question only, whereas those who report use answer all six CRAFFT questions (www.CRAFFT.org). The computer-facilitated approach takes adolescents on average less than 5 minutes to complete (Showalter et al., 2016) and requires only minutes of a pediatrician's time, making it a practical and efficient way to reduce risk of car crash injuries and death. Although the number of alcohol-related car crashes has recently declined, the rate of cannabis-related vehicle crashes is rising, especially in states that have legalized its use (Salomonsen-Sautel et al., 2014).

Conclusion

Pediatrician screening and brief counseling appears promising for reducing adolescents' short-term risk of riding with a substance-using driver, especially when the driver is an adult family member. More studies are needed using randomized designs that test new strategies to extend the effect of the intervention.

References

Beck, F., Guignard, R., & Legleye, S. (2014). Does computer survey technology improve reports on alcohol and illicit drug use in the general population? A comparison between two surveys with different data

- collection modes in France. *PLoS ONE*, 9, e85810. doi:10.1371/journal.pone.0085810
- Beck, K. H., Kasperski, S. J., Caldeira, K. M., Vincent, K. B., O'Grady, K. E., & Arria, A. M. (2010). Trends in alcohol-related traffic risk behaviors among college students. *Alcoholism: Clinical and Experimental Research*, 34, 1472–1478. doi:10.1111/j.1530-0277.2010.01232.x
- Bell, M. L., Kelley-Baker, T., Rider, R., & Ringwalt, C. (2005). Protecting you/protecting me: Effects of an alcohol prevention and vehicle safety program on elementary students. *Journal of School Health*, 75, 171–177. doi:10.1111/j.1746-1561.2005.tb06667.x
- Cartwright, J., & Asbridge, M. (2011). Passengers' decisions to ride with a driver under the influence of either alcohol or cannabis. *Journal of Studies on Alcohol and Drugs*, 72, 86–95. doi:10.15288/jsad.2011.72.86
- Clark, D. B., Martin, C. S., Chung, T., Gordon, A. J., Fiorentino, L., Tootell, M., & Rubio, D. M. (2016). Screening for underage drinking and *Diagnostic and Statistical Manual of Mental Disorders, 5th Edition* alcohol use disorder in rural primary care practice. *Journal of Pediatrics*, 173, 214–220. doi:10.1016/j.jpeds.2016.02.047
- DuPont, R. (2011). *Drugged driving research: A white paper*. Rockville, MD: Institute for Behavior and Health, Inc.
- Ewing, B. A., Tucker, J. S., Miles, J. N., Shih, R. A., Kulesza, M., Pedersen, E. R., & D'Amico, E. J. (2015). Early substance use and subsequent DUI in adolescents. *Pediatrics*, 136, 868–875. doi:10.1542/peds.2015-1143
- Harris, S. K., Csémy, L., Sherritt, L., Starostova, O., Van Hook, S., Johnson, J., . . . Knight, J. R. (2012). Computer-facilitated substance use screening and brief advice for teens in primary care: An international trial. *Pediatrics*, 129, 1072–1082. doi:10.1542/peds.2011-1624
- Harris, S. K., Johnson, J. K., Sherritt, L., Copelas, S., Rappo, M. A., & Wilson, C. R. (2017). Putting adolescents at risk: Riding with drinking drivers who are adults in the home. *Journal of Studies on Alcohol and Drugs*, 78, 146–151. doi:10.15288/jsad.2017.78.146
- Harris, S. K., Sherritt, L., Copelas, S., & Knight, J. R. (2016, September). *Reliability and validity of past-12-month use frequency items as opening questions for the updated CRAFFT adolescent substance use screening system*. Paper presented at the International Network on Brief Interventions for Alcohol and Drugs Annual Meeting, Lausanne, Switzerland.
- Knight, J. R., Sherritt, L., Shrier, L. A., Harris, S. K., & Chang, G. (2002). Validity of the CRAFFT substance abuse screening test among adolescent clinic patients. *Archives of Pediatrics & Adolescent Medicine*, 156, 607–614. doi:10.1001/archpedi.156.6.607
- Levy, S., Dedeoglu, F., Gaffin, J. M., Garvey, K. C., Harstad, E., MacGinitie, A., . . . Weitzman, E. R. (2016a). A screening tool for assessing alcohol use risk among medically vulnerable youth. *PLoS ONE*, 11(5), e0156240. doi:10.1371/journal.pone.0156240
- Levy, S. J., & Williams, J. F., & the Committee on Substance Use and Prevention. (2016b). Substance use screening, brief intervention, and referral to treatment. *Pediatrics*, 138, e20161211. doi:10.1542/peds.2016-1211
- Murray, M., Swan, A. V., Kiryluk, S., & Clarke, G. C. (1988). The Hawthorne effect in the measurement of adolescent smoking. *Journal of Epidemiology and Community Health*, 42, 304–306. doi:10.1136/jech.42.3.304
- National Highway Traffic Safety Administration. (2017a). *Traffic Safety Facts: 2015 data. Young drivers*. DOT HS 812 363. Retrieved from <https://crashstats.nhtsa.dot.gov/Api/Public/Publication/812363>
- National Highway Traffic Safety Administration. (2017b). *Traffic Safety Facts: 2016 data. Alcohol-impaired driving*. DOT HS 812 450. Retrieved from <https://crashstats.nhtsa.dot.gov/Api/Public/ViewPublication/812450>
- Newman, J. C., Des Jarlais, D. C., Turner, C. F., Gribble, J., Cooley, P., & Paone, D. (2002). The differential effects of face-to-face and computer interview modes. *American Journal of Public Health*, 92, 294–297. doi:10.2105/AJPH.92.2.294

- O'Donnell, A., Anderson, P., Newbury-Birch, D., Schulte, B., Schmidt, C., Reimer, J., & Kaner, E. (2014). The impact of brief alcohol interventions in primary healthcare: A systematic review of reviews. *Alcohol and Alcoholism*, 49, 66–78. doi:10.1093/alcalc/agt170
- O'Malley, P. M., & Johnston, L. D. (2013). Driving after drug or alcohol use by US high school seniors, 2001–2011. *American Journal of Public Health*, 103, 2027–2034. doi:10.2105/AJPH.2013.301246
- Rehm, J., Mathers, C., Popova, S., Thavorncharoensap, M., Teerawattananon, Y., & Patra, J. (2009). Global burden of disease and injury and economic cost attributable to alcohol use and alcohol-use disorders. *The Lancet*, 373, 2223–2233. doi:10.1016/S0140-6736(09)60746-7
- Salomonsen-Sautel, S., Min, S. J., Sakai, J. T., Thurstone, C., & Hopfer, C. (2014). Trends in fatal motor vehicle crashes before and after marijuana commercialization in Colorado. *Drug and Alcohol Dependence*, 140, 137–144. doi:10.1016/j.drugalcdep.2014.04.008
- Showalter, E., Knight, J. R., Sherritt, L., & Harris, S. K. (2016). Is screen time important? Efficacy of a computer-facilitated brief intervention for reducing adolescent substance use is predicted by viewing time [Abstract 60]. In *AMERSA 40th Annual National Conference: Book of abstracts*. Retrieved from <https://amersa.org/wp-content/uploads/2016-Book-of-Abstracts-complete.pdf>
- Steinka-Fry, K. T., Tanner-Smith, E. E., & Hennessy, E. A. (2015). Effects of brief alcohol interventions on drinking and driving among youth: A systematic review and meta-analysis. *Journal of Addiction and Prevention*, 3, 11.
- Students Against Destructive Decisions (SADD). (2016). *Contract for Life*. Retrieved from http://www.yellowribbonsd.org/wp-content/themes/yellow/images/contract_for_life.pdf
- Walters, S. T., Vader, A. M., Harris, T. R., & Jouriles, E. N. (2009). Reactivity to alcohol assessment measures: An experimental test. *Addiction*, 104, 1305–1310. doi:10.1111/j.1360-0443.2009.02632.x
- Williams, S., Whitlock, E., Smith, P., Edgerton, B., & Beil, T. (2007). *Primary care interventions to prevent motor vehicle occupant injuries*. Agency for Health Care Quality Publication No. 07-05103-EF-1. Portland, OR: Oregon Evidence-Based Practice Center.
- Winters, K. C., Stinchfield, R. D., & Henly, G. A. (1993). Further validation of new scales measuring adolescent alcohol and other drug abuse. *J Stud Alcohol*, 54(5), 534–541.