



Improving seat belt use among teen drivers: Findings from a service-learning approach



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ABSTRACT

Background: Low seat belt use and higher crash rates contribute to persistence of motor vehicle crashes as the leading cause of teenage death. Service-learning has been identified as an important component of public health interventions to improve health behavior.

Methodology: A service-learning intervention was conducted in eleven selected high schools across the United States in the 2011–2012 school year. Direct morning and afternoon observations of seat belt use were used to obtain baseline observations during the fall semester and post-intervention observations in the spring. The Mann–Whitney *U* test for 2 independent samples was used to evaluate if the intervention was associated with a statistically significant change in seat belt use. We identified factors associated with seat belt use post-intervention using multivariable logistic regression.

Results: Overall seat belt use rate increased by 12.8%, from 70.4% at baseline to 83.2% post-intervention ($p < 0.0001$). A statistically significant increase in seat belt use was noted among white, black, and Hispanic teen drivers. However, black and Hispanic drivers were still less likely to use seat belts while driving compared to white drivers. Female drivers and drivers who had passengers in their vehicle had increased odds of seat belt use.

Conclusion: A high school service-learning intervention was associated with improved seat belt use regardless of race, ethnicity, or gender, but did not eliminate disparities adversely affecting minority youth. Continuous incorporation of service-learning in high school curricula could benefit quality improvement evaluations aimed at disparities elimination and might improve the safety behavior of emerging youth cohorts.

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1. Introduction

Motor vehicle crashes (MVCs) ranked number one as the leading cause of death for young people aged 16–20 years in the United States and accounted for about 4000 teenage deaths in 2009 alone (NHTSA, 2012a). Even though mortality from MVC among young drivers has been declining, drivers less than 20 years old still have high rates of both fatal and nonfatal crashes compared with adults (IIHS, 2006). Teenagers drive less than drivers of all other age groups but have the highest crash rate per mile driven (IIHS, 2006; CDC, 2012a).

High crash rates for young drivers are attributed, in part, to immaturity and driving inexperience. This is evidenced by their engagement in high-risk driving behaviors, such as speeding, tailgating, driving under the influence of alcohol or drugs, underestimating hazardous driving situations, and driver distractions (Jonah and Dawson, 1987; Simons-Morton et al., 2005; NHTSA, 2012b,c). Lack of experience behind the wheel also makes it difficult for teens to recognize and respond to road and driving hazards. However, low use of safety belts is also a major reason why teens are killed or sustain severe injuries either as driver or passenger in a MVC (CDC, 2012a). Use of a seat belt either as a driver or passenger reduces the risk of being killed or severely injured in a motor vehicle crash by almost 50 percent (NHTSA, 2009). Seat belts prevent ejection from the vehicle, spread forces from the crash over a wide area of the body, allow the body to slow down gradually, and protect the head and spinal cord from serious injury (NHTSA, 2005). While it is important that people of all ages wear seat belts, it is especially important for teenagers because their crash rate is much higher than other age groups.

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Compared with other age groups, teens have the lowest rate of seat belt use. Despite efforts aimed at increasing belt use among teens, observed seat belt use among teens and young adults (16–24 years old) was 81% in 2009 and dropped to 79% in 2010, representing the lowest for any age group (NHTSA, 2011). Nationally in 2009, 3349 teen passenger vehicle occupants, ages 16–20, were killed in motor vehicle crashes, and 56 percent were unrestrained at the time of the fatal crash (NHTSA, 2010). In 2011, only 54% of high school students reported they always wear seat belts when riding with someone else (CDC, 2012b).

Rates of seat belt use among teens vary based on age, gender, race, and urban or rural setting and region of the country. In recent data released by the Centers for Disease Control and Prevention, the prevalence of rarely or never wearing a seat belt was higher among African American students (10.3%) and Hispanic students (9.3%) than White students (6.3%) (CDC, 2012b). Not only are interventions to increase seat belt use by young people greatly needed, but also targeted strategies that take into consideration age, gender, race, urban/rural, and regional differences in seat belt use are also needed.

Peer-to-peer education and youth-initiated monitoring of safety belt use among teens have a positive effect on teen belt use (NHTSA, 2005; Eyler et al., 2010). A service-learning approach has been found to be an effective alternative to traditional public health education campaigns. Through service-learning, students learn by developing and organizing efforts to solve real-world problems. Service learning also overcomes some of the barriers associated with a culturally inappropriate message and/or messenger found in traditional health education campaigns (Fiske, 2001; Eyler and Giles, 1999). Service-learning is rooted in experiential learning theory and involves methods under which students learn through active participation in thoughtfully organized service that: (1) is conducted in and meets the needs of a community; (2) is usually coordinated with a secondary school or institution of higher education; (3) helps foster civic responsibility; (4) is integrated into and enhances the (core) academic curriculum of the students in which the participants are enrolled; and (5) provides structured time for the students or participants to reflect on the service experience (Billig and Waterman, 2003).

In this study, we developed, implemented, and evaluated an educational program using a peer-to-peer service-learning approach to encourage teen safe driving behaviors in eleven urban US high schools across five states. We hypothesized that service-learning would lead to increases in observed seatbelt use from baseline to follow-up.

2. Methods

Based on reviews of the literature (Fiske, 2001; Eyler and Giles, 1999; Billig and Waterman, 2003) and the results of the preliminary study conducted by the Meharry team at other urban high schools (Eyler et al., 2010), we determined that service-learning could be an effective way to design and implement a culturally appropriate intervention to increase seat belt use in urban high schools with diverse minority populations, including both Hispanic and African American students.

The Teen Service-Learning Program (TSLP) for the present project was a peer-to-peer intervention designed to increase knowledge, create awareness, promote seat belt use, and encourage safe driving behavior among teens in public high schools. Eleven high schools across five states agreed to participate in the study. All states were primary seat belt law states, meaning that police can stop motorists simply for not wearing a seat belt. This contrasts with secondary seat belt laws, which require that a motorist

be stopped for another offense before a seat belt citation can be issued.

A lead teacher at each of the high schools was provided with in-service training on the use of service-learning methodology prior to the commencement of the study. The training was a half-day workshop using the service-learning orientation and training toolkit we developed for the study. The tool kit contains information about the key concepts of service-learning with examples, and suggested student activities and resources to assist in the promotion of seat belt use among their high school peers. The training workshop involved lectures and interactive discussion. Afterwards, the team met with each teacher to plan and discuss the implementation of the program and to be sure they understood the service-learning concept. Follow up during the implementation period was done by phone calls and review of monthly progress reports. A final progress report and self-evaluation including rating of the quality of the service-learning program at their school was submitted by the teacher. Also, at the end of the school year, each teacher was interviewed in person and given an opportunity to discuss their program and their self-ratings.

In addition to the service-learning program, student service-learning leaders from each high school were invited to submit written material about their school programs to compete for four Teen Safe Driving Champion awards which included recognition in ceremonies at their schools, certificates, and financial scholarships. The four award winners received \$1500 for first place, \$1200 for 2nd place, \$1000 for 3rd place and \$500 for 4th place. The top three winners and their teachers/mentors were provided an expense paid trip to the national service-learning conference in Minneapolis, Minnesota in April 2012.

The content of the intervention at each high school was developed by students with guidance and mentoring provided by their teacher and based on their schools' diverse cultural makeup. Some of the projects carried out in the schools included: (1) slogan competition and campaign promoting seat belt use to peers; (2) "safe prom" and auto safety day underscoring the importance of seat belt use; (3) research on the importance of seat belt use and development of weekly school-wide public service announcements; (4) development of a documentary displayed for the whole school on bulletin boards and in the cafeteria which included testimonies about car crashes and injuries from students, community members, staff, police, and health care workers; (5) collection of data on seat belt injuries and deaths and design of a memorial to students killed in MVCs with end-of-year seat belt rally; (6) billboard and t-shirt design competition and; (7) seat belt marketing and advertising in the community through radio and television jingles and a news release through the school district newsletter. The goal of the projects was to engage other students in activities that increase their awareness of and knowledge about the importance of regular seat belt usage.

Recruitment of students who participated in the design and implementation of the TSLP was done by the teacher at each of the participating high schools. An estimated minimum of twenty students per high school participated in the implementation of the TSLP and the student-led intervention activities reached between 500 and 1000 high school students in each school. The impact of the TSLP was expected to be felt both by the students who conducted the project and the peers they reached out to during the course of the intervention.

Rates of student seat belt use were observed at school parking lots before and after school both pre- and post-intervention. The observations were conducted using a personal digital assistant hand-held device (PDA) to capture data, with software specifically developed for this study during the earlier weeks of the fall semester. Observations were done by a research assistant with over 5 years' experience in observing seatbelt use assisted by at least two

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