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Evaluation of the California Child Passenger Safety Initiative

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ABSTRACT

Motor vehicle injuries are a leading cause of injury and fatality to children. Child restraint systems can reduce injury, and their use has been a long-time focus of policy and programmatic work. During this time, there has been a marked increase in the number of children restrained in vehicles and a steady decline in vehicle-related injuries and fatalities to children. However, data reveal that children of color, compared to white children, are at greater risk of injury in motor vehicle crashes. To address needs of “the children left behind” from safety advances, the California Child Passenger Safety Initiative (CPSI) was launched in 2002 for 18 months. The CPSI was an innovative program designed to increase use and decrease misuse of child restraint systems among the most vulnerable children in California; i.e., children of color and children living in poverty. The CPSI was designed to: increase use of child safety seats among families who use public medical services at selected sites; decrease the rate of child safety seat misuse among these families; and increase knowledge of the then-new California child passenger safety seat law. This study compared survey and observation data for two samples of families with children age six and younger: a pre-intervention sample, and a post-intervention sample. Although the results of this study were mixed, dramatic increases in the use of certain child restraints and decreases in the misuse of others were observed. Implications for program replication are discussed.

INTRODUCTION

Motor vehicle injuries to children have been extensively documented. For example, in the year 2000, 75 California children aged six and younger died from motor vehicle collisions, and close to 7,500 children were injured during the same year (1). In 2001 in the US, an average of six children, aged 14 or younger, were killed, and 732 were injured every day in motor vehicle crashes in the US (2). Responses to these tragedies have included implementation of a wide range of prevention activities including new laws that set standards for how children should be restrained at different weights and ages, enforcement and programmatic guidelines for protecting child passengers; programs for parents, child care teachers, and health care professionals; and research and development to make cars and car seats safer for children and easier for adults to install and use correctly.

Aside from gross misuse (which includes incorrect installation of the car seat in the vehicle or of the child in the harness), child restraints provide significant protection from serious injury or fatality to children in minor to serious crashes (3). Correct use of child restraint systems can further reduce injury. The National Highway Traffic Safety Administration (NHTSA) has estimated that properly installed child safety seats could reduce the risk of child fatalities by 71% and the risk of serious injuries by 67% (4).

In the years since child passenger prevention activities increased, there has been a steady increase in the number of restrained children and decline in injuries and fatalities to child passengers in vehicles. In 1984, 54% of children were unrestrained in vehicles; in 2001, only 9% were totally unrestrained (3), (4). From 1991 to 2001, infant and toddler fatalities decreased by almost 26% and 15%, respectively (2).

Despite this promising trend in reduced injuries in the US, children of color are at greater risk of injury as passengers in motor vehicle crashes compared to white children (5), (6). Between 1987 and 2000, the fatality rate due to unintentional injury for children under age 14 decreased by 39%; however, the smallest declines were among American Indian/Alaskan Native (20%) and Black (36%) children, whose death rates due to unintentional injury were nearly twice that of white children. (Though these data refer to unintentional injury as a whole, motor vehicle crashes were the leading cause of fatal injuries among children in 2000.)

Poor children, many of whom are children of color, also face disproportionate risk, and they are twice as likely as higher-income children to die in motor vehicle crashes (5), (6). Further, among injured children, poor children are more likely to die from their injuries than children from higher income families (7), (8), (9).

The Child Passenger Safety Initiative

To address the needs of “the children left behind” from safety advances, the California Child Passenger Safety Initiative (CPSI) was launched in 2002 for 18 months. The CPSI was an innovative program designed to increase the use and decrease the misuse of child restraint systems among the most vulnerable children in California through the public hospital and health care systems. The CPSI was made possible by a two-year, \$1.5 million grant from the California Office of Traffic Safety (OTS), which is charged with reducing fatalities, injuries and economic losses resulting from motor vehicle crashes through the California Highway Safety Plan. OTS is responsible for funding and coordinating traffic safety efforts throughout the state.

The California Health Care Safety Net Institute (SNI), which is an affiliate of the California Association of Public Hospitals and Health Systems, launched and directed the CPSI in collaboration with the University of California, Davis, Medical Center (UCDMC). SNI is dedicated to advancing community health through the resources and expertise of California’s public health care systems that provide health care to people regardless of their ability to pay for that care.

The CPSI focused on public hospitals in California. In 1999, California’s public hospitals treated as many as 3,000 children who had been injured in motor vehicle collisions. The majority of patients (76%) in California’s public hospitals are people of color, and 70% are low-income or uninsured. Forty-nine percent speak limited or no English (*California Health Care Safety Net Institute, 2002, unpublished data*). Given research showing that low income people and people of color are at greater risk for motor vehicle injuries (6), public hospitals and health systems—which serve this patient population—are key venues for working to prevent motor vehicle deaths and injuries to children.

Public health centers are also a prime venue for outreach and educational interventions. Recently, participants in the 2003 Child Passenger Safety Summit [which included a collaboration of child passenger safety (CPS) experts from industry, government, advocacy and research groups] recommended that health departments and health care providers deliver child passenger safety programs for vulnerable populations. In addition, participants recommended that health centers receiving federal funds should play a role in conducting child safety seat check ups and distributing child safety seats to low-income populations.

Seven public hospitals and health systems throughout California were involved in the CPSI. These included the Contra Costa Regional Medical Center, Monterey County Health Department/Natividad Medical Center, San Joaquin General Hospital, UC San Diego Medical Center, and the Los Angeles County Department of Health Services and three of its public hospitals (i.e., Olive View-UCLA Medical Center, Los Angeles County (LAC) and USC Medical Center, and Martin Luther King, Jr./Drew Medical Center.)

CPSI Project sites received funding and technical assistance to expand and improve child passenger safety education programs and to develop innovative models for reaching underserved populations. Activities included educating parents and caregivers about good child passenger safety practices and distributing free and low cost car seats, offering child safety seat inspections, and training physicians and nurses to teach patients about proper car seat use. There was a special outreach component that focused on education of foster parents and child welfare workers about child passenger safety. Sites also worked to integrate CPS activities into hospital protocols and health delivery systems.

The goals and objectives of the CPSI were to:

- increase child safety seat use among families using selected public health care sites;
- decrease the rate of child safety seat misuse among these families; and
- increase awareness of the then-new California child passenger safety law, SB 567, the “booster seat law,” that requires use of child safety restraints in vehicles for children age 6 or younger or who weighed less than 60 pounds.

The CPSI began April 1, 2002 and ended September 30, 2003. During the program:

- 9,780 child safety seats were distributed to low-income families;
- parents of 6,641 low-income children were shown how to fit their children into child safety restraints;
- 720 public health and child protective services staff received training in child passenger safety;
- 11,310 parents, caregivers and foster parents received education in child passenger safety; and
- 190 CPS check-ups took place during which trained observers provided technical assistance to parents about correct installation of child safety seats in vehicles.

To measure the impact of the project on parent knowledge, and self-reported and observed behavior, UCDMC and SNI contracted with the University of California at Berkeley Traffic Safety Center (TSC) to evaluate the project.

METHODS

The evaluation team used a quasi-experimental design. The evaluation consists of data collection before and after the above range of interventions, with a before-after comparison to measure any changes in parent knowledge, use and misuse of child safety seats. Types of data collected included parent or guardian knowledge and behavior and observations of parent behavior. The TSC worked with all study sites (i.e., public hospitals), SNI and the UCDMC to develop a survey tool and a data collection plan.

Sites

Pre-intervention data were collected between October 2001 and June 2002 at three public hospitals participating in the CPSI (i.e., Contra Costa, Monterey, and San Joaquin). Post-intervention data in the same sites were collected between January and May 2003.

Sample

Two separate cross-sectional samples of families were recruited for the pre- and post-intervention interviews. In both cases, the families were selected from treatment sites. Survey teams at three public hospitals gathered information on parents or guardians (through interviews) and children (through observations) when the children were ages six or younger. To recruit adults into the study, the CPS Coordinator at each of the three hospital sites determined the days when groups of parents or guardians of well babies or children up to age six were scheduled for visits, and when prenatal classes were being held. For parents with small children, when the family left their appointment site, the CPS Coordinator or other public health workers assisting with the project, approached them, explained the study, determined if any of the children were age six or younger, and (if so) asked parents or guardians for permission to conduct a brief interview and to accompany them to their car to observe their children after placement in their car seats. The study included all children six and under accompanying the parent or guardian that day.

Data Collection

Pre-intervention and post-intervention data were collected from two sources. (See Figure 1 for the data collection instrument.) The first source was a structured interview with a parent or guardian that included questions about demographic characteristics, the adult's relationship to the children, the children's ages and how the children usually traveled. The parents/guardians were also asked whether they knew about the 2002 Child Passenger Safety "Booster Seat" Law and about their use of child safety restraints. Data from adults who had driven their children to the medical appointments was gathered to learn about parents' and guardians' reported use and knowledge of child restraint systems. The interview with the parent or guardian was conducted in English or Spanish.

The second data source was observations gathered about restraint use. Observations were only collected for parents/guardians who had traveled by private vehicle to the hospital or clinic on the day of the interview and who had children with them. Observers accompanied families to their vehicles and documented vehicle types used, presence of air bags in the front passenger seats, children's ages and weights, restraint types and location in vehicle and position of children in restraints and vehicle. CPS Coordinators, public health nurses, social workers, and outreach workers conducted the observations. CPS Coordinators were all CPS-certified technicians, as were most, but not all, of the other observers. When not certified technicians, they were trained to conduct the observations.

The same data were collected before and after the CPSI Program was implemented at each site. In addition, however, during the post-intervention interview, parents/guardians were asked if they had participated in the pre-intervention interview.

The types of misuse studied were those identified in the literature as "critical" forms of misuse. Besides gross misuse, the most common and critical forms of misuse that can increase the risk of injury include loose harness straps on the child or a loose seat belt securing the child restraint to the vehicle (10). Other common mistakes are incorrect use of chest clips and use of shoulder straps at an inappropriate height (2), (11). Restraints that are inappropriate for the age of the child (e.g., being advanced too quickly into the "next" type of restraint) are also critical forms of misuse (12).

The UC Berkeley Committee for the Protection of Human Subjects and the Internal Review Boards of participating health systems approved the study.

RESULTS

In the pre-intervention sample, 496 parents were interviewed and 464 children were observed. In the post-intervention sample, 579 parents and guardians were interviewed and 521 children were observed. Very few of the pre-intervention sample were interviewed in the post-intervention sample. Approximately one-third of children were infants (30.4% under age 12 months), almost one-half (48.1%) were aged 1 to 4 years, and over 20% (21.6%) were aged 4 to 6 years. The age groups correspond to the age categories generally recommended for different kinds of child safety restraints. The majority of adults interviewed were Hispanic, female, and parents of the children who were observed.

The main results are described below according to the following three types of data (See Table 1):

- parent/guardian knowledge of the booster seat law;
- parent/guardian use of child safety seats; and
- observed use and misuse of safety seats.

Knowledge of the "Booster Seat Law"

Overall, 79.4% of the pre-intervention adult sample reported that they knew about the change in the child-passenger safety law that went into effect on January 1, 2002. That rate was slightly lower (74.6%) for the post-intervention adult sample (a statistically significant change with $p < 0.05$). A reason for this decrease might be that at the time of the pre-tests, there was significant media attention given to the law, and media attention subsequently declined in the period between the pre- and post-tests.

Parent/Guardian Reported Use of Child Safety Restraints

On average, for child passengers less than age four or less than 40 pounds, the reported use of infant, forward-facing and convertible child safety seats was equivalent for the pre-and post-intervention samples of parents and guardians (about 83% for both groups). Parents and guardians reported use of booster seats dipped slightly from 57% to 55%, but this change was not statistically significant.

Observed Use of Safety Seats

In both the pre-and post-intervention samples, about 30% of child restraints were misused by parents and guardians with regard to seat type and seat location with respect to airbags and seatbelts.

Observed Use—Percent Restrained

The number of observed children who were restrained increased in the post-intervention sample (94%) compared to the pre-intervention sample (90%, $p < 0.05$). Restraint use included any kind of child safety restraint, or seat belts when age and/or weight allowed, or when the vehicle type did not allow for booster seats (e.g., due to incompatibility of booster seats in the case of older cars without shoulder belts in the back seat.) Observed booster seat use decreased between the pre- and post-tests ($p < 0.05$).

Observed Misuse—Rear-facing, Forward-facing, and Booster Seats

Even when children are restrained appropriately for their age and weight, there are a number of errors that can be made with respect to actual installation and usage of rear- and forward-facing safety seats. The types of misuse tested decreased between the pre- and post-intervention samples of children. The following significant reductions in misuse were observed ($p < 0.05$):

- the safety seat was not secured tightly enough to vehicle (decreased from 70%-61%);
- the harness clip was not at armpit level (decreased from 62% to 41%);
- the child was not secured tightly enough by the harness strap (decreased from 60% to 41%);
- the harness strap was not at the appropriate level for the child's shoulders (decreased from 66% to 20%);
- the seat was not in the correct reclining or vertical position in the vehicle (decreased from 22% to 9%);
- the vehicle belt was not properly routed through the booster seat (decreased from 9% to 4%); and
- the seat back of the booster was at an improper level for the child's head (decreased from 21% to 17%).

Overall, we found that observed use of infant and forward-facing safety seats for children under four years and 40 pounds in the post-test (94%) was greater than observed use of booster seats for children between ages four and six years and between 40 and 60 pounds (54%).

DISCUSSION

The results of this study showed important improvements, but also some declines in CPS use or knowledge. A key finding was that observed inappropriate placement of children in safety restraints was almost 20 percentage points lower in the post-intervention sample. Many other types of misuse were also significantly lower in the post-intervention sample including the failure to secure the child safety seat tightly in the vehicle or to tighten the harness around the child adequately. In contrast, parent and guardian knowledge about the "booster seat law" was lower in the post-intervention sample. Reported use of child safety restraints was similar for both samples.

This study used a population-based sample, looking cross-sectionally at hospital or health system patients before and after the interventions. The evaluation team considered a study design that looked at individuals so that it would be possible to measure specifically the impact of the intervention in each individual. However, it was not possible to do so due to the lack of both staff resources at the sites and funding for tracking individuals. It is possible, though, that a study design that tracked individuals might have yielded more dramatic results. For instance, the positive results found could have been at least partially diluted by the fact that the target population was sampled as a whole, and that many of the people who were given post-tests might not have had the intervention.

For the pre-intervention sample, the percentage of drivers who reported that they always used booster seats appropriately (i.e., for children up to age six or 60 pounds) was significantly lower than the percentage of drivers who reported knowledge about the booster seat law.

For the post-intervention sample, while 75% of parents and guardians knew about the law, only about 56% reported use of booster seats for their own children age four or older or weighing 40 pounds. It is possible that while parents and guardians knew about the new law, they may not have been aware of the details, misunderstood the law, or had not implemented the provisions concerning restraint use for children over four years and 40 pounds. Further, although efforts were made to ensure that the parents or guardians in the post-intervention sample had already been exposed to the intervention offered, this could not be guaranteed, and adults in the post-intervention sample may have received little or none of the CPS program(s).

Observed use of restraints exceeded self-reported use. This may be due to the fact that the observed use of child restraints was only conducted for families that traveled to the medical appointment by private vehicle that day. Parents and guardians who either did not travel by vehicle or who do not own car seats or who do not regularly use car seats would have been included in the self-reported data, but not in the observational data.

Although observations were only made for families who drove on the day of their interview, observations are arguably a more valid source of data, since they do not rely on self-reported information.

Further, parents and guardians were taking children to hospitals or health care systems, and could have been more mindful about healthy behaviors as a result. Results showed parents were more likely to use rear-facing and forward-facing child seats appropriately than booster seats.

Findings here documented largely positive changes in the use of child passenger safety seats among low-income and largely Hispanic families seeking outpatient treatment in public hospital settings. These findings are consistent with the hypothesis that the CPSI may have influenced restraint use by these parents and guardians. However, it is difficult to conclude that the CPSI is responsible for the changes demonstrated here since pre- and post-intervention data were collected from different samples of families, and since actual exposure of post-intervention parents to the intervention was not directly measured. Other factors, such as increased public exposure in general to information about the “booster seat law” and child safety seats during this historical period might have contributed to the increased and appropriate use of child safety seats.

Unfortunately, evaluations of pragmatic interventions in real-world settings are often more difficult than in controlled laboratory settings. Nevertheless, the CPSI demonstrates a concrete strategy for integrating CPS into the health care service delivery system, and delivering hands-on education as well as car seats to low-income target populations.

With regard to misuse, this paper reports on forms of misuse that are seen as particularly dangerous for children. The CPSI had an impact on these forms of misuse, an outcome that also leads to the assertion that the project should continue and be expanded. The fact that project activities appear to have had no effect on placement of child restraints in the vehicle argue for continued research and evaluation about what works in CPS outreach and education, as well as a closer connection between program planning, activities and evaluation.

The results of this study suggest important areas for future work on child passenger safety. Research and experience from the field highlight barriers to use that, specifically, low-income people and people of color face in promoting child safety. To work so that all children see the positive impacts of child passenger safety efforts, it is crucial to target underserved populations, integrate CPS into health care systems and continuing education efforts, use research to plan safety programs and injury patterns, to pay attention to policy and advocacy, and collaborate through multidisciplinary coalitions.

Target underserved populations

Since children in some communities of color and other low-income communities face higher risk of motor vehicle injuries than the general population, it is evident that the range of efforts to date – policy, research and development, educational and outreach – have fallen short in protecting these children. Interventions that focus on these high-risk groups are needed. Outreach and educational efforts that specifically target children in low-income and ethnically diverse communities can make a large difference in overall child safety (8), (9).

Such efforts should focus on increasing safety seat use by eliminating cost and access barriers and on decreasing the most serious and common types of misuse. Distributing child safety seats for families (either free or through vouchers to purchase them at a low cost) is crucial. Hands-on workshops—not just instructional brochures—conducted in multiple languages and in culturally appropriate ways are also essential.

Integrate CPS into health care systems and continuing education efforts

Traffic injuries cost California \$20 billion in 2000. Increasing children’s safety in vehicles can reduce emergency room and rehabilitation costs; hence, public health care systems can potentially benefit financially from good prevention programs. Unfortunately, prevention programs often fall prey to budget cuts, and child passenger safety programs are no exception. Public hospitals and health systems can support CPS efforts by incorporating CPS programs into regular health care and health education services and into education for health professionals who then can educate parents and guardians and promote outreach and car seat distributions to low-income families.

At one project study site, at least, there is follow-up activity to the CPS Initiative, although there has been no continued funding for this project. In Contra Costa County, the Head Start program took over child restraint distribution activities and received training in the parent education curriculum in order to continue to train parents in CPS matters, including proper installation. A local private hospital has hired a laid off staff person originally funded by the project, and entered into an agreement which included using the original parent training and observation

materials. The hospital is also conducting presentation and car seat check ups at some of the public health system's clinics.

Use research to plan safety programs and injury patterns

The current study suggests that a program that a) developed protocols around CPS service delivery, b) reached out directly to vulnerable populations by coupling health care with health education, and c) established mechanisms for getting child safety seats into the hands of those who need them has been successful, overall, in increasing CPS use and decreasing misuse. This program may be a model intervention for helping to prevent motor vehicle injuries among children. Research is still needed to demonstrate efficacy, improve design of such programs, and facilitate implementation.

Recent research has focused on promising interventions to increase use of child restraints in vehicles among vulnerable populations. Comprehensive programs that include legislation, training, enforcement, and community-oriented strategies show promise as unified strategies to promote use of restraints (13), (14). Evaluation of these programs, though, is essential.

Research has also shown that, even when misused, forward-facing child restraints still are effective in preventing serious injury (3). Therefore, when working with people who are disproportionately less likely to use safety seats, [e.g., due to barriers including economic (cost of seats), cultural (car seats may be unfamiliar to many immigrants, who may believe it is safer to hold a child on one's lap), or structural (not owning new vehicles with the latest CPS technology and the most expensive safety seats, all of which together increase the ease and fit of the safety seat in the vehicle)], CPS specialists should focus outreach and educational efforts to increase use of the safety seats and to reduce the most dangerous types of misuse.

Pay attention to policy and advocacy

Policy and advocacy efforts should be part of any injury-prevention effort. Laws often provide the muscle behind educational and enforcement efforts to promote public health. According to NHTSA, good child-restraint laws: include guidelines for specific ages and weights of children that reflect research on child development and injuries; cover all seating positions in a vehicle; require all vehicles to have safety belts; contain provisions for enforcement; and eliminate exemptions. One area for potential advocacy could be addressing the lack of booster seats manufactured for older cars that do not have shoulder belts, which prevents many lower-income children from riding safely.

California's child passenger safety law, SB 567 (or the "booster seat" law) provided impetus to the CPSI. Not only did it specify increases in the age and weight requirements for securing children, it included provisions whereby economically disadvantaged families could obtain child restraints, and it defined a public health education role for health care providers.

Collaborate through multidisciplinary coalitions

Child safety is and should be everyone's business. Health care leaders, law enforcement and traffic safety professionals, social workers, educators, business leaders, automobile and car seat manufacturers and retailers, and community members are all natural partners for child safety efforts. Broad-based groups focused on child safety reduce the stress on a single system—health care, for example—and promise more far-reaching results. Further, comprehensive programs that include legislation, training, enforcement, and community-oriented strategies such as distributions of safety seats can increase their use. Great advances have been made to protect children, and all children should have access to these advances. The CPSI convened multiple partners and played an important role in reaching some of California's most vulnerable children. Children face significant risk while riding in vehicles; it is society's mandate to protect them.

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References

1. Cooper, J.F. Keeping Children Safe in Cars. *Access*. No. 24, 2004, pp. 16-21.
2. 2003 Child Passenger Safety Summit. <http://www.actsinc.org/Acrobat/CPSSummitReport.pdf>. Accessed July 20, 2004.
3. Arbogast, K.B., D.R. Durbin, R.A. Cornejo, M.J. Kallan, and F.K. Winston. An Evaluation of the Effectiveness of Forward Facing Child Restraint Systems. *Accident Analysis and Prevention*. Vol. 36, 2004, pp. 585-589.
4. Kahane, C.J. An Evaluation of Child Passenger Safety: The Effectiveness and Benefits of Safety Seats. NHTSA, U. S. Department of Transportation, www.nhtsa.dot.gov/cars/rules/regrev/evaluate/ChildSeat/CSS.html. Undated. Accessed August 15, 2003.
5. National Safe Kids Campaign. Report to the Nation: Trends in Unintentional Childhood Injury Mortality, 1987-2000. http://www.safekids.org/content_documents/nskw03_report.pdf, May 2003. Accessed July 20, 2003.
6. Baker, S.P. ER Braver, L.H. Chen, J.F. Pantula, and D. Massie. Motor Vehicle Occupant Deaths among Hispanic and Black Children and Teenagers. *Archives of Pediatric Adolescent Medicine*. Vol. 152, 1998 pp. 1209-12.
7. National SAFE KIDS Campaign. Children at Risk Fact Sheet. http://www.safekids.org/tier3_cd.cfm?folder_id=540&content_item_id=1031. Accessed July 15, 2004.
8. Lee, J.W., Fitzgerald, K. Ebel, B.E. Lessons for Increasing Awareness and Use of Booster Seats in a Latino Community. *Injury Prevention*. Vol. 9, 2003, pp.268-269.
9. Istre, G.R., M.A. McCoy, K.N. Womack, Fanning, L., Dekat, L., Stowe, M. Increasing the Use of Child Restraints in Motor Vehicles in a Hispanic Neighborhood. *American Journal of Public Health*. Vol. 92, 2002, pp. 1096-1099.
10. Decina, L.E. and K.H. Lococo. *Misuse of Child Restraints*. Report No. DOT HS 809 671. NHTSA, U. S. Department of Transportation, 2004.
11. Rudin-Brown, C.M., J.K. Kumagai, H.A. Angel, K.M. Iwasa-Madge, and Noy, I.N. Usability Issues Concerning Child Restraint System Harness Design. *Accident Analysis and Prevention*. Vol. 35, 2003, pp. 341-348.
12. Misuse of Child Restraints. Traffic Safety Facts. NHTSA, U. S. Department of Transportation. www.nhtsa.dot.gov/people/injury/traffic_tech/2004/TT290.htm. Accessed July 22, 2004.
13. Dellinger, A.M., P.C. Groff, A.D. Mickalide, and P.A. Nolan. Kids in Cars: Closing Gaps in Child Occupant Restraint Laws. *The Journal of Law, Medicine and Ethics*. Supplement to Vol. 30, 2002, pp-. 150-156.
14. Zaza, S., V.G. Carande-Kulis, D.A. Sleet, D.M. Sosin, R.W. Elder, R.A. Shults, T.B.Dinh-Zarr, J.L. Nichols, R.W. Thompson and Task Force on Community Preventive Services. Methods for Conducting Systematic Reviews of the Evidence of Effectiveness and Economic Efficiency of Interventions to Reduce injuries to Motor Vehicle Occupants. *American Journal of Preventive Medicine*. Vol. 21, 2001, pp. 23-30.

LIST OF FIGURES

FIGURE 1 Data Collection Instrument: Parent/Guardian Survey and Child-Passenger Observation Form (Pre- and Post-Intervention)

FIGURE 1 Data Collection Instrument: Parent/Guardian Survey and Child Passenger Observation Form (Pre- and Post - Intervention)

 Date	 Location	 Surveyor
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INTERVIEW

Demographics

 Zip Code	Driver (check one) ☐ Parent ☐ Relative ☐ Foster/Guardian ☐ Friend ☐ Sitter ☐ Other	 Driver Age	Driver Gender ☐ Female ☐ Male	Driver Race (check one) ☐ Asian ☐ Black ☐ Hispanic ☐ American Indian ☐ White ☐ Other
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Transportation

How do you usually travel?

☐ Own Car
 ☐ Other's Car
 ☐ Public Transit
 ☐ Taxi
 ☐ Walk
 ☐ Other

Car / Booster Seat

Y N

☐ ☐ Do you know of the Jan 1, 2002 law that requires children ages 4-6 or 40-60 lbs to be seated in a car or booster seat?

☐ ☐ Do you have a carseat for each child up to age 4 and 40 lbs?

☐ ☐ Do you have a car or booster seat for each child between the age of 4 and 6 or 40-60 lbs?

☐ ☐ Have you been shown how to put the car seat(s) into car correctly? By who _____

☐ ☐ Have you been shown how to buckle child(ren) into car seat correctly? By who _____

	Always	Often	Some	Rarely	Never	NA
How often do you use car seat(s) for child(ren) 0-4 and up to 40 lbs?	☐	☐	☐	☐	☐	☐
How often do you use car seat(s) for child(ren) 4-6 or 40-60 lbs?	☐	☐	☐	☐	☐	☐
How often do you move car seat(s) and base for travel in different cars?	☐	☐	☐	☐	☐	☐

Comments _____

☐ Has someone asked you these same questions before? (Participated in pre-test)

VEHICLE OBSERVATION

☐ Traveled by car today

Vehicle Characteristics

OBSERVATION – Child Passenger 1 (Child must be present to complete this section)

Child characteristics		
Child's Age _____ Child's Weight _____		
Restraint Type (Check one)	Location (Check one)	Seat belts (Check one)
☐ No restraint of any kind ☐ Using seat belt only ☐ In rear facing car ☐ In front facing car seat ☐ In booster seat Comments _____	☐ In front seat ☐ In back seat	☐ No seat belt ☐ Lap belt only ☐ Lap/shoulder belt
If in Car Seat (Check all that apply)	If in Booster Seat (Check all that apply)	
☐ Car seat not in correct position (reclining/vertical) ☐ Harness retainer clip not at armpit level ☐ Harness straps not at correct level (above/at/below shoulders) ☐ Strapped in, more than one adult finger fits b/t chest and harness ☐ Vehicle belt not secured to car seat tightly Other misuse/Comments _____	☐ Vehicle belt not properly routed ☐ Middle of ears not higher than vehicle seat back	

OBSERVATION – Child Passenger 2 (Child must be present to complete this section)

Child characteristics		
Child's Age _____ Child's Weight _____		
Restraint Type (Check one)	Location (Check one)	Seat belts (Check one)
☐ No restraint of any kind ☐ Using seat belt only ☐ In rear facing car ☐ In front facing car ☐ In booster seat Comments _____	☐ In front seat ☐ In back seat	☐ No seat belt ☐ Lap belt only ☐ Lap/shoulder belt
If in Car Seat (Check all that)	If in Booster Seat (Check all that)	
☐ Car seat not in correct position (reclining/vertical) ☐ Harness retainer clip not at armpit level ☐ Harness straps not at correct level (above/at/below shoulders) ☐ Strapped in, more than one adult finger fits b/t chest and harness ☐ Vehicle belt not secured to car seat tightly Other misuse/Comments _____	☐ Vehicle belt not properly routed ☐ Middle of ears not higher than vehicle seat back	

List of Tables

TABLE 1 Comparison of results for pre- and post-intervention samples for each of three sites and for all sites.

TABLE 1 Comparison of results for pre- and post-intervention samples for each of three sites and for all sites.

Comparison of Results for pre- and post-intervention samples for the total sample and for each of three sites.								
	PRE-INTERVENTION				POST-INTERVENTION			
	Contra Costa %	Mon- terey %	San Joaquin %	Total %*	Contra Costa %	Mon- terey %	San Joaquin %	Total %*
A. Survey data – booster law (n)	(134)	(197)	(165)	(496)	(198)	(204)	(177)	(579)
Drivers with knowledge of the booster seat law effective January 1, 2002	53.0	93.4	84.2	79.4	52.5	93.6	77.4	74.6
B. Survey data – car seat use (n)	(108)	(145)	(145)	(398)	(166)	(179)	(169)	(514)
Drivers who report they always use car seats for child passengers (0-4 and to 40 lbs.)	89.8	84.8	75.2	82.7	83.7	87.7	76.3	82.7
C. Survey data – booster seat use (n)	(48)	(27)	(103)	(178)	(67)	(69)	(129)	(265)
Drivers who report they always use booster seats for child passengers (between ages 4-6 and 40-60 pounds)	62.5	44.4	58.3	57.3	52.2	73.9	47.3	55.5
D. Observational data – all child passenger safety restraint types (n)	(87)	(190)	(169)	(446)	(215)	(92)	(149)	(456)
Children restrained in child safety seats or vehicle belts when appropriate	83.9	90	93.5	89.4	97.7	90.2	98.0	94.4

	Contra Costa %	Mon- terey %	San Joaquin %	Total %*	Contra Costa %	Mon- terey %	San Joaquin %	Total %*
E. Observational data – Infant and forward-facing child safety seats (n)	(62)	(117)	(141)	(320)	(183)	(53)	(126)	(362)
Seat not in correct reclining or vertical position in vehicle	14.5	23.9	23.4	21.9	4.9	5.7	16.7	9.1
Harness clip not at armpit level	46.8	82.9	51.8	62.2	31.2	60.4	48.4	41.5
Harness strap not at appropriate level re: child's shoulders	16.1	20.5	35.5	26.3	23.0	17.0	15.9	19.7
Harness strap not tight enough on child	59.7	76.1	46.8	60.0	31.2	75.5	42.1	41.5
Safety seat not secured tightly enough to vehicle by seat belt	71.0	73.5	66.7	70.0	65.0	43.4	63.5	61.3
F. Observational data – Booster seats (n)	(12)	(28)	(34)	(74)	(22)	(12)	(43)	(77)
Vehicle belt not properly routed through seat	16.7	7.1	5.9	8.1	0.0	0.0	7.0	3.9
Seat back at improper level for child's head	0.0	50.0	2.9	20.3	0.0	41.7	18.6	16.9
D. Observational data – all child passenger safety error (n)	(93)	(191)	(196)	(480)	(232)	(94)	(180)	(506)
	83.9	82.2	72.5	78.6	73.7	81.9	68.9	73.5

*Percents are weighted by number of participants at each site