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Child Passenger Safety State of Knowledge: A Literature Review

Child car seats reduce fatal injury by 71 percent for infants under 1 year old, by 57 percent for children 1 to 3 years old, and by 58 percent for children 4 to 7 years old (Kahane, 2015). It is estimated that 11,606 lives were saved by child restraint systems (CRSs; e.g., car seats) from 1975 to 2017 (NCSA, 2023). However, motor vehicle crashes remain a leading cause of death of children (Centers for Disease Control and Prevention, 2021). This Traffic Tech summarizes findings from a systematic literature review of behavioral safety research on child passenger safety (CPS) published from 2000 to 2022, focused on children up to age 12, and conducted in the United States. For detailed findings, as well as more information about the methods and supporting references, please see the associated final report by Passarge et al., 2026, doi: 10.21949/02w2-ef55.

Non-Use

Non-use describes a lack of restraint use in any form. Non-use was rare for children under age 1; as they grew older, however, they were more likely to ride unrestrained. Drivers who had lower incomes, were Black, or lived in rural areas were more likely to travel with unrestrained children than those with higher incomes, who were White, or lived in urban areas. Non-use was also more likely for certain types of trips, including short trips and taxi or ride-share trips. Children in areas with stronger child restraint use laws were more likely to be restrained.

Misuse

Misuse describes restraint use that is incorrect according to current recommendations. Common misuses included inappropriate restraint selection, inadequate installation, and incorrect use of the restraint. The most common selection error was premature transition from booster seat to seat belt. For rear-facing seats, common installation mistakes included an incorrect angle of recline and loose installation attaching the CRS to the vehicle. Installation errors were less common in forward-facing seats and booster seats. For forward-facing seats, the most common mistakes in restraint use were loose or incorrectly placed harness straps. For booster seats, the most frequently observed misuse was incorrect shoulder belt position or fit.

Misuse of child restraints was more likely among drivers who were Black, had lower incomes, had lower education levels, or lived in rural areas, compared to drivers who were White, had higher incomes, had higher education levels, or lived in urban areas. Children in pickup trucks were more likely to be incorrectly restrained than those in other vehicles. Misuse was also predicted by a lack of knowledge about correct use, lack of experience, lack of confidence, and a low perception of risk. Misuse was associated with older age of vehicles, low ease of use of the CRS, caregivers using a different car than usual, and more passengers.

Education and Outreach

Research in this area included evaluation of educational programs that provided information directly to caregivers, the training of child passenger safety technicians (CPSTs), and the deployment of CPSTs to convey CPS information. Educational programs increased caregiver knowledge and improved child restraint use, especially when a program consisted of a variety of activities. Effective educational content included presentation of risk concepts and tailoring information to the child's needs and caregiver's existing level of knowledge.

The presentation of information in multiple contexts enhanced the effectiveness of CPS education and messaging; common contexts included health care settings, community events, and schools. CPSTs conveyed information and conducted interactive hands-on training. Information was also conveyed by health care workers, community leaders, and online resources. Multi-modal training including a hands-on component also appeared to be more effective than passive education methods, and education alone was less effective than multifaceted interventions including education along with enforcement and/or low-cost access to devices.

Legislation and Enforcement

Enactment of State child restraint laws was associated with increases in use rates and decreases in child injuries and fatalities in motor vehicle crashes. Laws were an important source of child restraint information for caregivers, and caregivers described the requirements as the reason for their restraint practices. Seat belt laws that increased adult restraint use also increased child restraint use. Enforcement was described as a key component for CPS campaigns, with effectiveness greatest when combining law enforcement with education and messaging. CPS laws vary among States and jurisdictions, and laws tend to lag behind current recommendations and best practices.

Communities With Lower CRS Use

Some communities have lower child restraint use rates and more misuse of restraints. Barriers for child restraint in these communities included the cost of CRSs, knowledge and access to information, and misconceptions about CRSs, especially booster seats. Promising solutions were multifaceted and included low-cost CRS distribution, education, and aspects of enforcement. Community-led programs may be more effective than others, particularly those that include community ownership of the program, decision-making by community members, training that places expertise within the community, and visible activities led by community members.

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