

Public Health Briefs

The Tennessee Child Restraint Law in Its Third Year

ALLAN F. WILLIAMS, PHD, AND JOANN K. WELLS, BA

Abstract: Observations of child travel were made in Knoxville and Nashville, Tennessee, and Lexington and Louisville, Kentucky about two and one-half years after the Tennessee child restraint law went into force. Use of child restraints anchored by seat belts increased in Tennessee from 8 per cent prior to the law to 29 per cent, compared to a change from 11 to 14 per cent in Kentucky, which does not have a child restraint law. Travel in arms, a hazardous practice permitted by the law, was at the same level in Tennessee and Kentucky as prior to passage of the law. (*Am J Public Health* 1980; 71:163-165.)

A Tennessee law, effective January 1, 1978, requires parents or legal guardians of children less than four years old residing in Tennessee to use child restraint systems when transporting their children in motor vehicles* owned by the parents, and to ensure that the restraints are used properly.¹ Alternatively, the law permits children to be held in the arms of older passengers. This practice is hazardous both because a restrained adult cannot sufficiently restrain a child in a crash, and because an unrestrained adult is likely to crush the child against interior structures of the vehicle.^{2, 3} Fines for violations of the law may range from \$2 to \$10.

In order to assess the effects of the law soon after it went into force, observations of children traveling in automobiles were made in Knoxville and Nashville, Tennessee about five months before the law went into force (July-August 1979) and in the fourth month after it was in force (April 1978).⁴ Observations of child travel for comparison purposes

*Recreational vehicles of the truck or van type, and trucks weighing one ton or more, are exempted.

From the Insurance Institute for Highway Safety, Washington, DC. Address reprint requests to Allan F. Williams, PhD, Senior Behavioral Scientist, Insurance Institute for Highway Safety, Watergate 600, Suite 300, Washington, DC 20037. This paper, submitted to the *Journal* July 31, 1980, was revised and accepted for publication September 30, 1980.

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were also made at these times in Lexington and Louisville, Kentucky, an adjacent state not having a child restraint law.

The results of these surveys indicated that the use of child restraints anchored by seat belts increased in Tennessee from 8 to 16 per cent compared to an increase from 11 to 15 per cent in Kentucky. Travel in arms increased in Tennessee from 23 to 28 per cent, while in Kentucky it decreased from 19 to 14 per cent.**

In May 1980, observations of child travel were repeated in the four cities. In the period between the two sets of post-law observations, there had been extensive public information and educational activities concerning the law throughout the state, and some enforcement, especially in late 1979 and 1980. In January and February 1980, 180 persons were cited for violations of the law.⁵

Surveys conducted by the University of Tennessee Transportation Center in five major urban areas and one rural area in Tennessee indicate that the statewide use rate of child restraints was 9 per cent prior to the law, 15 per cent in May 1978, 13 per cent in November 1978, 16 per cent in May 1979, and 19 per cent in November 1979.⁵ However, these data are not adequate for assessing effects of the law. They are based on child restraints however used, whereas the law requires proper use. Improper use, which is common,⁶ lessens and may not provide any crash protection at all. Secondly, without data on child restraint use rates in comparable non-law areas, the possibility that the increases in use in Tennessee may reflect changes that would have occurred over time in the absence of the law cannot be ruled out.

Methods

The same methods were used in the May 1980 survey as in the two prior surveys.⁴ In each of the four cities, observa-

**The Tennessee increase in travel in arms was due to a 24 to 38 per cent rise in Nashville; in-arms travel decreased somewhat in Knoxville. An extensive public information and education campaign concerning the law had begun in Nashville, but not Knoxville, before the post-law observations were made, raising the possibility that increased awareness of the law led to the increase in the transportation of children in arms in Nashville.

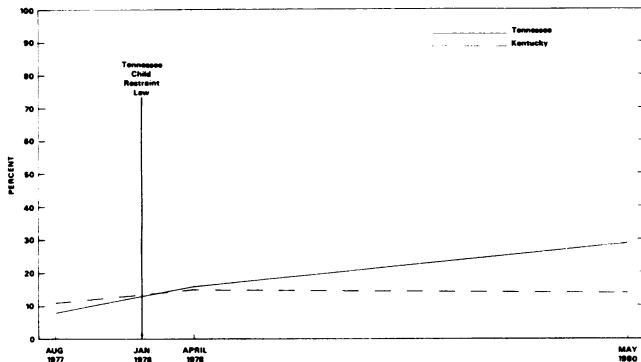


FIGURE 1—Per Cent Use of Child Restraints Anchored by Seat Belts Before and After Tennessee Law in Force (January 1, 1978)

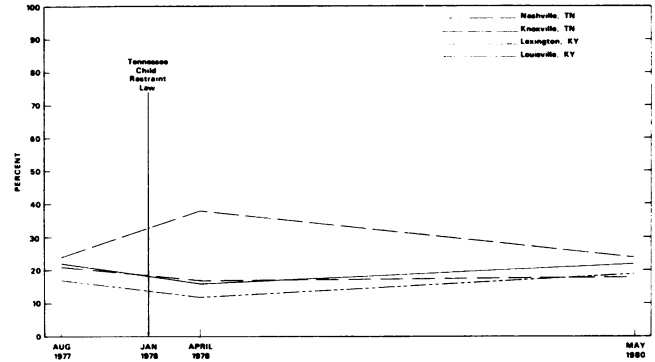


FIGURE 2—Per Cent Traveling in Arms of Passengers Before and After Tennessee Law in Force (January 1, 1978)

tions were made at stop signs and traffic lights at exits from the same shopping centers that had been surveyed previously. If cars stopping at these exits contained one or more children who appeared to be less than four years old, information was obtained from drivers on ages of the children and their relationship to the driver, and observations on how the children were traveling were made and recorded. If child restraints were in use, it was observed whether they were anchored by vehicle seat belts because this is an essential component of the proper use of restraints. In both Tennessee and Kentucky, only children in cars with in-state license plates were included in the analysis.

Results

Observations were made of 2,111 automobile passengers reported to be less than four years old who were traveling in in-state vehicles in Tennessee and Kentucky.***

In May 1980, use rates of child restraints anchored by seat belts were 29 per cent in Tennessee, and 14 per cent in Kentucky. Figure 1 shows use rates in the Tennessee and Kentucky cities before and after the Tennessee law went into force. Since April 1978, the fourth month the law was in force, use rates in Tennessee increased from 16 to 29 per cent, while there was no change in Kentucky. Use rates in Tennessee thus increased from 8 per cent before the law went into force to 29 per cent in its third year.†

Use of child restraints anchored by seat belts varied considerably in the four cities: Knoxville, 33 per cent; Nashville, 25 per cent; Lexington, 21 per cent; Louisville, 8 per cent.

***In Tennessee, 1,108 children (578 in Knoxville, 530 in Nashville) were observed, and in Kentucky 1,003 (461 in Lexington, 542 in Louisville).

†Results of statistical tests are not generally presented in this paper because in assessing effects of the law, the magnitude of the change in use rates is more important than statistical significance. However, the increase from 8 to 29 per cent in Tennessee is statistically significant ($\chi^2 = 117.06, p < 0.001$), as is the 29 vs 14 per cent difference in use rates between Tennessee and Kentucky ($\chi^2 = 67.92, p < 0.001$).

Children whose parents were driving comprised 79 per cent of the total sample. Use rates of child restraints in cars with parents as drivers were 34 per cent in Tennessee and 16 per cent in Kentucky, as compared to 11 per cent in Tennessee and 6 per cent in Kentucky when drivers were not parents.

Use rates in Tennessee, compared to Kentucky, were 41 vs 28 per cent for those less than age one; 42 vs 22 per cent for one year-olds; 26 vs 11 per cent for age two; and 13 vs 2 per cent for age three.

Vehicle seat belts were used by 4 per cent of Tennessee children less than age four, and by 5 per cent in Kentucky. Seat belt use was concentrated at ages two and three.‡‡

Travel in arms was only slightly higher in Tennessee (23 per cent) than in Kentucky (19 per cent) in May 1980, whereas in the fourth month of the law the Tennessee rate had been double the Kentucky rate (28 vs 14 per cent). Figure 2 shows that in each of the four cities, including Nashville, children were traveling in arms two and one-half years after the law was in force at about the same rate as prior to the law.

Discussion

Observations of child travel made two and one-half years after the Tennessee law went into force suggest that its potential for harm, because of the provision allowing children to be held in arms, can be largely discounted because the surge in travel in arms observed in Nashville in the fourth month of the law does not appear to have been permanent. Nevertheless, strong efforts should be made to decrease this hazardous practice, by amending the law so that travel in arms is illegal, and enforcing the amended law.

Since the law went into force, use of child restraints anchored by seat belts has increased markedly in Knoxville and Nashville, Tennessee, compared to very little change in

‡‡Even though it has been shown that seat belts do provide crash protection to small children,⁷⁻¹⁰ although probably not as much protection as child restraints properly used, their use is not permitted by the Tennessee law.

the Kentucky cities surveyed. These results in Tennessee are encouraging. However, it should be noted that the most recent results from statewide surveys conducted in Tennessee (November 1979) show that Knoxville and Nashville had higher use rates than all other urban and rural areas surveyed.⁵ Thus it is likely that the May 1980 use rate statewide was lower than 29 per cent. Rates would be lower still had other criteria for proper use of child restraints been included, such as anchorage of top tether straps and fastening child restraint harness systems. For example, use of the harness system is necessary for crash protection in restraints in which the vehicle seat belt anchors the restraint but not the child, and addition of this criterion decreases rates of proper use somewhat in both Tennessee and Kentucky.

Despite the substantial increase in use of child restraints anchored by seat belts in Tennessee, more than 70 per cent of the observed children were not being transported in compliance with the law. Although child restraint laws should be encouraged, they are not a panacea, and should be considered as one of a mix of strategies that need to be promoted to increase the protection of children in cars. These include education of parents by pediatricians,¹¹ strengthening federal standards to force manufacturers to provide interior compartment designs that protect children in crashes to the maximum extent possible,¹² and passive restraints such as air bags that provide crash protection automatically and do not require the active, voluntary cooperation of parents.

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