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Short Communication

Safety awareness and use of child safety seats among parents after the legislation in Shanghai

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ABSTRACT

Purpose: To investigate the changes and underlying mechanisms in parents' safety awareness and the use of child safety seats after the mandatory legislation in Shanghai city, China.
Methods: This study was carried out by Shanghai Key Laboratory of Environment and Children's Health using a multi-stage, simple random sampling method. Volunteers with children aged 0–12 months were recruited. Child safety seats were sent to each volunteer's family. Telephone encounters and/or on-site visits were used to collect data from parents using a phased survey on children's safety during car use.
Results: Among all respondents, 91.2% had heard of motor vehicle accidents involving children, and 97.2% could describe the appropriate use of a safety seat to minimize the risk of child injury in a collision. Among 1078 families with newborns, awareness of child safety seats was 91.9%. There were 86% patients aware that new laws and regulations have been released regarding the use of child safety seats, and 98.5% of them plan to comply with the new laws. Moreover, 61% patients think that taxis should be routinely equipped with child safety seats.
Conclusion: The parents in Shanghai obtained a high level of awareness of children's traffic safety after the introduction of child safety seats legislation, and had a positive experience related to the use of child safety seats. Taxi may be an important area of focus for implementation of child traffic safety. Traffic safety laws and regulations with further impact should be continuously studied.

Introduction

Road traffic injuries are one of the main causes of injuries and deaths for children, and have become the leading killer among all global health hazards to children. In China the rapid economic development has resulted in a sharp increase in urban car ownership; while the rising motor vehicles has made traffic injuries one of the leading causes of death among children under the age of 14. Therefore protection of children from traffic injuries must take the top priorities.

The use of child safety seats was regarded the most important preventive measure to reduce motor vehicle injuries and deaths among children.[1] The large number of motor vehicles and rapid urbanization in China make related legislation urgently necessary. Shanghai, as a leading urban center in China, took the initiative at the Standing Committee of the 14th National People's Congress in 2013 by revising the "Shanghai Minors Protection Regulations," which created a mandate that from March 1st, 2014, an age-appropriate child safety seat must be utilized in private cars for children under the age of 4. The present study investigated the changes in parents' awareness of children traffic safety after the introduction of this legislation and analyzed the possible reasons.

Methods

Subjects

A stratified random sampling method, combined with Shanghai Key Laboratory Environmental and Children's Health birth study

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project, was used to recruit families with newborns. Parents of 2100 newborn children in Shanghai were asked to complete a children's safety status questionnaire when their children were newborn, 42 days, 3 months, 6 months and 12 months.

Research methods

Surveys were conducted upon study enrollment by trained specialists in seven hospitals located in Shanghai according to a unified standard. The seven hospitals included: Shanghai Red House Hospital, Xinhua Hospital, Chongming Branch of Xinhua Hospital, Children's Hospital, Children's Medical Center, One Maternity and Child Health Hospital, and National Women's Hospital. The enrollment survey inquired whether the subject's family owned a private car and whether the mother planned to live in Shanghai for more than two years after childbirth. Questionnaires collected the following information: (1) whether the subject had heard of a motor vehicle accident involving at least one child; (2) whether they were familiar with correct use of safety measures to avoid injuries to children during car accident; (3) whether they were aware of regulations regarding the use of child safety seats; (4) whether they were planning to use child safety seats; and (5) whether a child safety seat had installed in the family's private car and if not, why.

Quality control

All questions were asked twice, and answers were excluded from the analysis if the subject failed to adequately complete the questionnaire or if repeat answers were contradictory.

Statistical analysis

EpiData 3.1 was used to build the database, and SPSS 17.0 was used for statistical analysis. The results were expressed as percentages, and chi-square tests were used between groups. The test level is $\alpha = 0.05$.

Results

All of the respondents were Shanghai residents for 2 years or more, and 67.4% owned a motor vehicle. Most parents (88.6%) were between the age of 30–35 years, and 91.2% were not Shanghai natives (Table 1).

By the end of 2016, a total of 2100 questionnaires were distributed and 2065 valid questionnaires were retrieved (98.3% data acquisition). The age distribution of children in enrolled families was: 1078 newborns, 424 at six weeks, 355 at 3 months, 51 at 6 months and 97 at 12 months (Table 1).

Among all of the respondents, 91.2% had heard about motor vehicle accidents involving children; 97% were familiar with the correct use of safety measures to avoid children's injuries during car accidents, and the safety awareness was 91.9% among the 1078 parents with newborn children (Table 2). Awareness of the new legal requirement for child safety seats was reported by 86.2% of respondents. Among respondents who reported using a child safety seat, 98.5% cited legislation as their motivating factor, whereas 63.5% from pediatrician's recommendation (Table 2).

Among the 484 families with six-week-old children, 88.0% could describe correctly how to install safety seats and 84.9% knew the weight limits of the equipment, whereas 65.5% felt confident about their use of the safety seat. In this group, child safety seats were placed next to a window by 74.6% of respondents. Ninety-four percent of respondents reported that relatives and friends also used child safety seats. Of the 355 families with 6-month-old children, only 55.5% were using safety seats. Among all respondents, 64.8% provided feedback that taxis should routinely provide child safety seats (Table 2).

Among parents that did not use child safety seats, the most common reason provided was inconvenience (33.6%); while only 5.1% did not believe that the seats provided additional safety for their children (Table 3).

Discussion

The World Health Organization (WHO) estimates that road traffic injuries will become the third most common cause of human health impairment by 2020. Injuries and deaths of children in motor vehicle accidents are becoming a global public health problem.[2] Road traffic injuries have become the second most common cause of injuries and deaths for children aged 5–14 years, trailing only infectious diseases. A survey conducted by National Highway Safety Administration (NHISA), USA, has shown that

Table 1
Information of families investigated in the research.

Basic information	*n*	%
Owning personal motor vehicle	1092	67.4
Age of children's parents (years)		
25–29	97	4.7
30–35	1830	88.6
36–45	138	6.7
Work of parents		
Out of home for work	1883	91.2
Others	182	8.8
Age of children		
1 day	1078	52.3
42 days	484	23.4
6 months	355	17.2
9 months	49	2.4
12 months	97	4.7

Table 2
Evaluation of children's safety seat and legislation awareness among parents.

Evaluation of awareness	*n*	%
Heard of children's motor vehicle accidents	323	91.2
Know the correct use of child safety seat can avoid traffic accident damage	345	97.2
Know the special seat for children	991	91.9
Know the introduction of children' s safety seat legislation in Shanghai	929	86.2
Plan to use children's safety seat	1062	98.5
Using children's safety seats by pediatrician	685	63.5
Using children's safety seats by relatives and friends	457	94.4
Good feeling after use of child safety seat	317	65.5
Know the suitable age and weight	411	84.9
Know how to install	426	88.0
What position is usually placed in the car		
Front passenger side	14	2.9
Middle of the back	92	19.0
The rear window	361	74.6
Others	17	3.5
Use safety seat while going out		
Always	197	55.5
Occasionally	76	21.4
No use	82	23.1
Private cars use child safety seats	273	82.7
Taxi use child safety seats	78	23.9
Consider the taxi should be regular provide child safety seats	217	64.8

Table 3
Experience of using safety seats and the reasons not to use child safety seats.

Experience and analysis	*n*	%
Experience		
Good	317	65.4
General	104	21.4
Bad	5	1.0
The reasons not to use child safety seats		
Economic restrictions	3	2.2
Think not so necessary	8	5.8
Think not so safe	7	5.1
Think very trouble	46	33.6
Others: the child is not comfortable, too small, etc	73	53.3

deaths in motor vehicle accidents was the leading cause of death in children in 2017.[3]

Rapid economic development in China has caused an increase in traffic accidents. For the ten-year period prior to 2008, China ranked first in the world for traffic-related deaths. Moreover the death rate is almost 2.5 times that of Europe and the United States. Traffic injuries have become one of the major causes of death among children less than 14 years old. Children's traffic safety must therefore be recognized as a public health priority.

One reason for the surge of road injuries in China may be related to a discrepancy between material development and spiritual development. Although increasing attention has been paid to children's safety in recent years, the awareness remains low, even among parents. For example, recent data suggest that among 967 families with children under 7 years old in Shanghai, 93.9% do not use child safety seats and children are held by adults in 32.0% of families.[4] A survey in Beijing also revealed that only a very small number of families use child safety seats.[5]

Motor vehicle injuries are generally preventable, and the use of child safety seats is the most important precautionary measure. Child safety seats (also known as child restraint systems) are specifically designed for infants and children. Durbin et al.[6] studied the impact of car safety seats among 229,106 children involved in 146,613 motor vehicle accidents between 1998 and 2002. The use of age-appropriate safety seats proved safer than sitting alone in the rear seat, and the placement of safety seats in the rear provided the best protection. Child safety seats are very effective if they are installed and used correctly. They are associated with a 71% reduction in the risk of death among children aged 1–4 year, and a 54% reduction among children aged 4–7 years.[7] Compared with the use of conventional seat belts, child safety seats can achieve 59% reduction in the risk of injury among children aged 4–7 years.[8]

In China limited public awareness of the safest location for children and the use of safety seats continue to increase the risk of child traffic-related injuries. The use of child safety seats in China has not yet become widespread. Many parents have only heard of it, but have little effective knowledge of related safety issues, or some even never heard of it. For example, a survey in Beijing showed that nearly 2/3 of the 1,069 parents said that children are required to use child safety seats while traveling, but only 12 children were observed in a correctly used safety seat, while others were placed in an inappropriate place or incorrectly used.[5] A survey in Shantou also showed that only 8.7% of 3,333 children and passengers used seat belts and 0.6% used child safety seats, while more than half (56.1%) of children were sitting on adult passenger's legs.[9]

There are several reasons for the poor implementation of child car transportation safety in China: (1) China's traffic laws and regulations have not required the use of safety seats; (2) there is a lack of domestic technical regulations and evidence-based support; (3) effective public education campaigns are inadequate, and there is not enough recognition of the importance of child safety seats; (4) child safety seats continue to be expensive in China, often beyond the average family's purchasing power.

With the improvement of living standards, there is a growing concern on children's car safety in China. Shanghai, a leading urban center, first published the Regulations on the Protection of Minors in China in 2013. According to this new set of regulations, children under the age of 4 must be provided the proper use of child safety seats from March 1, 2014. The current study shows that parents of children in Shanghai do, in fact, have a high awareness of new laws and regulations on child safety seats. And if the equipment is available, a high proportion of families are willing to use the child safety seats. Most parents know how to use, how to choose or adjust according to the age and weight of children, and report a positive use experience. There exist many facts that why children's safety seats are not universally used, i.e. inconvenience, cost, and so on. Only a very small number of parents have not recognized the importance and best safety of child safety seats in transporting children.

The back seat is the safest seat for children, and many studies show that children sitting in the back seat can reduce death or injury. A study in Australia found that children sitting in front seats of passenger cars were more likely to be seriously injured than the rear seats. Braver et al.[10] studied 26,233 children involved in fatal accidents between 1988 and 1995, and found that children under the age of 12 sitting in the rear had a 36% reduction in the risk of fatal injury compared to the front. This study also showed that most parents place the child safety seats in the rear seats.

In conclusion, the current study found that, after the legislation of child safety seat in Shanghai, parents paid more attention to their children's automobile safety, and correspondingly increased the use of child safety seats. This successful example in Shanghai suggests that prevention of road traffic injuries is feasible in China; legislation can help foster more widespread use of safety seats. In the future, relevant government departments and units should increase public education regarding child safety seats, introduce more basic knowledge regarding the method of use, and provide assistance with the purchase.

Conflict of interest

There are no conflicts of interest.

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