



Car Seat Knowledge and Car Seat Use among Parents of Preschool Children in Bangkok, Thailand

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Abstract

Background: Road traffic accident is one of the leading causes of death in children. Appropriate car seat use can reduce the severity of injuries.

Objective: The aims of this study were to collect information on car seat use and to compare the knowledge of parents of preschoolers in Bangkok regarding road traffic safety for children including car seat use before and after receiving car seat brochure by using pretest and posttest questionnaires.

Methods: The pretest questionnaires were sent out to parents of preschoolers in 3 randomly selected schools and were collected 3 days later. Thereafter, the car seat brochures and the posttest questionnaires were sent to the parents and the questionnaires was collected back after 2 weeks.

Results: Of the 309 parents, 254 (82.2%) completed the pretests and 135 (43.7%) of them also completed the posttest questionnaires. Among 254 parents, most of them were female. All of them knew about car seat, mostly from the internet (73.2%) and relatives (40.6%). Among 233 parents who used car to take their children to school, 82.0% had ever used car seat but only 21.5% of them always used it. The most important reason for not using car seat was children's refusal. The overall score of knowledge about car seat increased after receiving car seat brochure.

Conclusions: This study demonstrated that very few parents used car seat for every ride of their young children. Car seat brochure may increase knowledge but more strategies are needed to improve car seat use for child passenger safety.

Keywords: car seat, car accident, child injury, injury prevention



ความรู้และการใช้เบาะนิรภัยในรถยนต์สำหรับเด็กของผู้ปกครองนักเรียนอนุบาลในกรุงเทพมหานคร

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บทคัดย่อ

บทนำ: อุบัติเหตุในท้องถนนเป็นสาเหตุหลักของการเสียชีวิตในเด็ก การใช้เบาะนิรภัยที่เหมาะสมสามารถลดความรุนแรงของการบาดเจ็บได้

วัตถุประสงค์: เพื่อรวบรวมข้อมูลการใช้เบาะนิรภัยสำหรับเด็ก และเปรียบเทียบความรู้ของผู้ปกครองนักเรียนอนุบาลในกรุงเทพมหานครเกี่ยวกับความปลอดภัยบนถนน และการใช้เบาะนิรภัยก่อนและหลังได้แผ่นพับความรู้

วิธีดำเนินการวิจัย: สุ่มเก็บข้อมูลจากผู้ปกครองนักเรียนอนุบาล 3 โรงเรียน โดยให้ผู้ปกครองตอบแบบสอบถามก่อนได้รับแผ่นพับ และส่งคืนภายใน 3 วัน จากนั้นแจกแผ่นพับความรู้ และให้ตอบแบบสอบถามหลังได้รับแผ่นพับภายใน 2 สัปดาห์

ผลการวิจัย: มีผู้ปกครองที่ตอบแบบสอบถาม 309 คน โดยเป็นผู้ที่ตอบแบบสอบถามก่อนได้รับแผ่นพับ และตอบทั้งก่อนและหลังได้รับแผ่นพับจำนวน 254 คน (ร้อยละ 82.2) และ 135 คน (ร้อยละ 43.7) ตามลำดับ ผู้ตอบแบบสอบถามส่วนใหญ่เป็นเพศหญิง ทุกคนรู้จักเบาะนิรภัยในรถยนต์สำหรับเด็ก โดยส่วนใหญ่รู้จักจากอินเทอร์เน็ต (ร้อยละ 73.2) และคนรู้จักแนะนำ (ร้อยละ 40.6) ในจำนวนผู้ตอบแบบสอบถามที่รับส่งบุตรหลานโดยรถยนต์ทั้งหมด 233 คน ร้อยละ 82.0 เคยใช้เบาะนิรภัยในรถยนต์สำหรับเด็ก และมีเพียงร้อยละ 21.5 ที่ให้บุตรหลานใช้เบาะนิรภัยทุกครั้งโดยสารรถยนต์ สาเหตุส่วนใหญ่ที่ไม่ใช้เนื่องจากบุตรหลานไม่ยอมนั่ง คะแนนความรู้เกี่ยวกับเบาะนิรภัยในรถยนต์สำหรับเด็กเพิ่มขึ้นหลังผู้ปกครองได้รับแผ่นพับ

สรุป: มีผู้ปกครองเพียงส่วนน้อยที่ให้บุตรหลานใช้เบาะนิรภัยทุกครั้งโดยสารรถยนต์ และแผ่นพับช่วยเพิ่มความรู้เกี่ยวกับเบาะนิรภัยในรถยนต์สำหรับเด็ก แต่ควรมีมาตรการอื่นร่วม เพื่อสนับสนุนการใช้เบาะนิรภัยเพื่อความปลอดภัยของเด็ก

คำสำคัญ: เบาะนิรภัยในรถยนต์สำหรับเด็ก, อุบัติเหตุรถยนต์, การบาดเจ็บของเด็ก, การป้องกันการบาดเจ็บ

Introduction

Unintentional injury is the most common cause of death in children aged 5-14 years, causing 38.7% of total deaths. Among those injuries, traffic injury is the most common cause for up to 36%¹. Data from the Bureau of Epidemiology of Thailand showed that among children younger than 15 years old who were reported to have severe injury in 2015, road traffic accident was the most common cause (39.2%, 8,255/21,077) and was also the most common cause of death from injury in this age group (61.5%, 252/410)².

The World Health Organization (WHO) reported reduction of injuries and deaths by up to 70% and 54%, respectively in children aged 1-4 years when using appropriate car seat³. In 2015, the American Academy of Pediatrics (AAP) and the National Highway Traffic Safety Administration recommend using a rear-facing infant or convertible car seat in children less than 2 years old. Children over 2 years old or with body weight between 9-18 kilograms should remain on forward facing car seat on the back seat of the car. Children older than 8 years old may use booster seat with regular safety seat belt. The position of the seat belt strap should rest upon the shoulder, not the neck or face and the other strap should rest upon the thighs, not across the abdomen⁴⁻⁶.

In 2018, the AAP updates new recommendation suggest that children should remain in a rear-facing car seat until 4 years old. For children over 4 years old or body weight up to 60 pounds (27 kilograms) or up to the car seat's weight and length limits, should use a forward-facing car seat on the back seat of the car⁷.

In the United States of America and most European countries, there are laws for car seat enforcement in children, whereas in Thailand, only using safety seat belts and helmets are required by law for cars and motorcycle, respectively.

A study from China reported that only 17.1% of parents used car seat for their children regularly. Factors associated with car seat use were children of young age, high level of education of parents, high socio-economic status, and awareness of importance of children's safety by using car seats⁸. A study in Turkey reported similar findings that only 20% of parents used car seat for their children and only 10% of them used it correctly⁹. In contrast to a report from Brazil that up to 84.3% of parents regularly used car seats for their children¹⁰. A study in Thailand in 120 parents who took their children to the well-baby clinic at 4 hospitals in 4 regions of Thailand between June 2014 to June 2015 which included Trang Hospital, Lampang Hospital, Khon Kaen Hospital and Queen Sirikit National Institute of Child Health, reported that 80% of parents knew about car seats, but only 20% had ever used car seats prior to enrollment. Reasons for not using car seat included lack of parents' confidence in using car seats, lack of parents' knowledge, limited space in the car, inconvenience when installing car seat, refusal by children, and inconvenience when using car seat¹¹.

Vajira Hospital is one of a teaching university hospitals located in Dusit District, an urban district in Bangkok, Thailand that has 26 preschools. Most of the parents take their children to schools by private cars or motorcycles, which may lead to traffic problems and may be at risk for road traffic accidents. The objectives of this study were to collect information on car seat use of parents of preschoolers (3-5 years old) and to compare their knowledge regarding road traffic safety for children including car seat use before and after receiving car seat brochure.

Methods

A prospective before and after study was

conducted by collecting data from questionnaires. Inclusion criteria was parents of children in preschools near Vajira Hospital. Exclusion criteria were parents who refused to participate in the study and parents whose pretest and posttest questionnaires were completed by different person.

After the approval by the Vajira Institutional Review Board, Faculty of Medicine, Vajira Hospital, we randomly selected 3 preschools by its location on three different roads near Vajira Hospital. The teachers at each school were asked to distribute the inform consents and pretest questionnaires to the parents of all preschool children. Three days later, the pretest questionnaires were collected along with the distribution of car seat brochures and the posttest questionnaires. Parents were asked to return the posttest questionnaires within 2 weeks. The pretest and posttest questionnaires were the same and consisted of 3 parts: Part 1 was the demographic data of parents, Part 2 consisted of Part 2A and Part 2B. Part 2A included 2 questions asking whether they have heard about car seat and the sources of car seat information. Part 2B included 8 questions to assess parents' knowledge of road traffic safety for children including car seat. Part 3 consisted of 5 questions to assess parents' attitudes and practices of using car seat. The questionnaires were validated and approved by 7 pediatricians at Vajira Hospital and were used in a pilot study in another school. The brochure contents were adapted from the information from Thailand's Bureau of Epidemiology, Thailand's Guideline in Child Health Supervision, WHO, National Highway Traffic Safety Administration and AAP^{2-6, 12}.

Data were presented as number, percentage and mean. The proportion of parents with correct answer for each question in the pre and posttest of Part 2B were compared by using McNemar's Chi-Square's test. The full score of the pre and

posttest questionnaires were compared by using paired t-test. P value less than 0.05 was considered statistically significant. All analyses were conducted in SPSS version 22.

Results

From July to October, 2018, the questionnaires were sent out to parents of all children in the schools. There were a total of 309 parents, 254 (82.2%) completed the pretests while 135 of them also completed the posttests and 55 (17.8%) did not complete any questionnaire. The demographic data of the 254 parents are shown in Table 1. The average age of parents was 39 years old. Most of them were female (71.7%) and 69.7% were the mother of the child. The levels of education of parents were Bachelor degree or higher in 92.9% and most of them had a family income of more than 50,000 baht per month. Most of the parents (91.7%) used cars to take their children to schools. Previous road traffic accident of the child was reported from 9 parents (3.5%).

Knowledge of parents about road traffic safety for children including car seat before receiving brochure (N = 254)

All parents knew about car seats. Sources of car seat information were the internet (73.2%), relatives (40.6%), brochures/advertisement/books (29.1%) and health care providers (9.0 %). The 8 questions in Part 2B used to measure changes in knowledge before and after receiving car seat brochure are shown in Table 2. Most parents (88.6%) answered correctly that preschoolers should be placed in the back seat of the car (Question no. 2) and 92.5 % knew that using car seat can protect children from road traffic accidents better than using seat belt alone (Question no. 6) as shown in Table 2.

Table 1:

Demographic data of parents (N = 254)

Characteristic	N	%
Age (years) (mean \pm SD)	39.1 \pm 6.1	
Sex		
Female	182	71.7
Male	72	28.3
Relationship with the child		
Mother	177	69.7
Father	68	26.8
Others	9	3.5
Education		
Primary/secondary school	4	1.6
Vocational/high vocational certificate	9	3.5
Bachelor degree	148	58.3
Master degree	78	30.7
Doctorate degree	10	3.9
No answer	5	2.0
Family income (baht per month)		
Less than 50,000	38	15.0
50,001 - 75,000	63	24.8
75,001 - 100,000	48	18.9
100,001 - 125,000	26	10.2
125,001 - 150,000	23	9.1
More than 150,000	46	18.1
No answer	10	3.9
Occupation		
Government/ state enterprise officer	90	35.4
Employee	72	28.3
Merchant/businessman	63	24.8
Others	29	11.5

Table 1:

Demographic data of parents (N = 254) (Continued)

Characteristic	N	%
Vehicle use for the child ^a		
Cars	233	91.7
Motor cycle	45	17.7
Public transportation	11	4.3
Bicycle	6	2.4
School bus	3	1.2
Others	12	4.7
Previous child's road traffic accident		
No	245	96.5
Yes	9	3.5

^a Can answer more than one choice

Table 2:

Knowledge of parents on road traffic safety for children including car seat use before receiving the brochure (N = 254)

No.	Questionnaire item	N	%
1	The leading cause of severe traumatic injury and death in children < 15 years old in Thailand		
	Road traffic accident ^a	104	40.9
	Don't know	63	24.8
	Drowning	61	24.0
	Fall	16	6.3
	Physical abuse	7	2.8
	Others	3	1.2
2	Proper location for preschoolers in the car		
	Back seat ^a	225	88.6
	Front seat	13	5.1
	No difference between front seat and back seat	8	3.1
	Don't know	8	3.1

Table 2:

Knowledge of parents on road traffic safety for children including car seat use before receiving the brochure (N = 254) (Continued)

No.	Questionnaire item	N	%
3	Proper direction of car seat for preschoolers		
	Forward facing ^a	199	78.3
	Rear facing	47	18.5
	No difference between forward facing and rear facing	5	2.0
	Don't know	3	1.2
4	Children need to be put in car seat until what age?		
	3 years old	31	12.2
	7 years old	152	59.8
	13 years old ^a	39	15.4
	Don't know	32	12.6
5	Using seat belt alone is safe enough for preschoolers		
	Incorrect ^a	194	76.4
	Correct	22	8.7
	Don't know	38	15.0
6	Comparison between using car seat and seat belt to prevent injury in preschooler		
	Car seat is better than seat belt ^a	235	92.5
	No difference	1	0.4
	Don't know	18	7.1
7	When accident happens in preschooler who use seat belt alone		
	Injury will be more severe than car seat use ^a	156	61.4
	No difference in severity of injury compared to car seat use	33	13.0
	Don't know	65	25.6
8	Installing mattress in the back seat helps to prevent injury when accident occurs		
	Incorrect ^a	199	78.3
	Correct	11	4.3
	Don't know	44	17.3

^a correct answer

Attitudes, practices and factors associated with car seat use (N = 233)

Among 233 parents who took their children to school by car, 191(82.0%) had ever used car seats for their children and among these 191, 41 (21.5%) used it every time. The most common reason for using car seats was awareness of the benefit from using car seats (92.7%). The reasons for not using car seats were refusal by children, difficulty in installation/limited car space and expensiveness in 57.1%, 28.6% and 19.0%, respectively (Table 3).

Knowledge before and after receiving brochure (N = 135)

After receiving car seat brochure, the percentages of correct answers for the leading cause of death in children less than 15 years old and the oldest age of children needed car seat increased significantly compared to before receiving brochure (40.0% to 57.8%, $p < 0.001$ and 16.3% to 38.5%, $p < 0.001$, respectively, Table 4).

The full score for the questionnaires was 8 points. The mean scores and standard deviations of pretest and posttest were 5.50 (S.D. 1.46) and 5.98 (S.D. 1.63), respectively. The mean difference was 0.48 (95% confidence interval 0.22-0.74), $p < 0.001$. This showed that parents of preschool children gained knowledge significantly after receiving car seat brochures.

Discussion

In this study, all parents knew about car seat, most of them got the information from the internet and relatives. Only 9% reported that they knew from their health care providers. Most parents knew that preschoolers should be placed in the back seat of the car and that using car seats can better protect children from road traffic accident

than using seat belt alone. However, despite the relatively high level of education, 82.0% of parents who took their children to school by car had ever used car seat but only 21.5% of them used it on every ride of their children. After receiving the brochure, the car seat knowledge increased significantly from before receiving brochure.

A previous study in Thailand in 2014 and 2015 found that only 20% of parents had ever used car seat¹¹. The percentage of car seat use was much lower than our study which might be due to different population, location and timing of study. However, the reasons for not using car seat were similar, including refusal by children, difficulty in installation/limited car space and expensiveness. These reflect that there are opportunities to improve car seat use. Health care providers should educate all family members about the benefit of car seat use and help them find the ways to improve children's compliance of using car seat such as to use car seat since their first ride and to make staying in car seat a routine for the family. Moreover, it is important to use appropriate car seat for each and every ride to protect children from unexpected road traffic accidents, such as "no car seat, no ride".

In our study, most common source of car seat information was the internet, only 9% of participants reported that they knew about car seat from their health care provider. Child passenger safety should be included in routine anticipatory guidance such as during prenatal conversation, at the time when a newborn baby is discharged from the hospital and at every well-baby clinic visit.

Table 3:

Attitudes, practices and factors associated with car seat use (N = 233)

Questionnaire item	N	%
Have ever used car seat before		
Yes	191	82.0
No	42	18.0
Reason for using car seat ^a (N = 191)		
Awareness of the benefit of car seat	177	92.7
Own a car seat	52	27.2
Friend's suggestion	23	12.0
Reason for not using car seat ^a (N = 42)		
Children's refusal	24	57.1
Difficulty in installation/limited car space	12	28.6
Expensiveness	8	19.0
Children rarely ride in the car	6	14.3
Others	2	4.8
Frequency of car seat use (N = 191)		
Every time (100%)	41	21.5
Nearly every time (75% - 99%)	42	22.0
Mostly (50% - 74%)	36	18.8
Once in a while (25% - 49%)	47	24.6
Rarely (1% - 24%)	25	13.1
Frequency of seat belt use (N = 231) ^b		
Every time (100%)	58	25.1
Nearly every time (75% - 99%)	51	22.1
Mostly (50% - 74%)	42	18.2
Once in a while (25% - 49%)	28	12.1
Rarely (1% - 24%)	17	7.4
Never (the child sat on adult's lap)	25	10.8
Never (the child sat alone)	10	4.3

^a Can answer more than one choice^b Two parents did not answer this question

Table 4:

Knowledge of parents before and after receiving brochure (N = 135)

QUESTION	PRETEST		POSTTEST		p-value ^a
	CORRECT		CORRECT		
	n	%	n	%	
1. Leading cause of death in children < 15 yrs old	54	40.0	78	57.8	0.001
2. Proper location for preschoolers in the car	122	90.4	126	93.3	0.424
3. Proper direction of car seat for preschoolers	107	79.3	102	75.6	0.487
4. Oldest age of children who need car seat	22	16.3	52	38.5	<0.001
5. Using seat belt alone for preventing accidents	107	79.3	111	82.2	0.585
6. Comparison between using car seat and using seat belt alone for preventing accidents	131	97.0	128	94.8	0.508
7. Severity of injury when using seat belt alone	93	68.9	98	72.6	0.678
8. Injury associated with using mattress in the back seat	106	78.5	112	83.0	0.268

^a McNemar's Chi Square test

In 2018, the AAP published updated recommendations on car safety seats based on re-analysis of the previous data. The new recommendation states that children should remain in a rear-facing car seat until they reach the highest weight or height allowed by their seat¹³. The age specific milestone of transitioning at 2 years old was removed as well as the age for changing from a forward-facing car seat to a belt-positioning booster seat which should depend on the height and weight limits for their seats, then until the vehicle's safety seat belt fits properly. This new recommendation is more practical for parents and may promote more car seat use. However, the most important thing is to use the right car seat for every trip.

Strategies to increase car seat use may also include setting up programs advertised in social media concerning the importance of car seat use, helping parents to get access to car seats through

second-hand shops, loans or low-cost rentals and teaching parents how to properly install and use them¹⁴. In addition, the government needs to legislate child passenger safety laws with enforcement in order to protect the lives of our children.

There were some limitations to the study. Firstly, we enrolled only the preschools near our hospital and planned to recruit all parents but the number was small, so the result may not represent car seat use in Bangkok as a whole. Secondly, we did not focus on the actual practice of using car seat including the correct installation of car seat. Thirdly, we did not collect information on change in car seat use after receiving the brochure. However, our study revealed that among parents of preschoolers in Bangkok, the capital and most populous city of Thailand, who knew about car seat, most of them did not use it regularly, so more strategies are needed to improve car seat use.

Disclosure statement

The authors report no conflict of interest.

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