

Child Passenger Safety Training for Pediatric Interns: Does it Work?

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ABBREVIATIONS: CPS = child passenger safety, AAP = American Academy of Pediatrics, RF = rear-facing, FF = forward-facing, WCC = well-child check

ABSTRACT

OBJECTIVE: Evaluate the efficacy of a child passenger safety (CPS) educational intervention on the CPS-related knowledge, attitude and anticipatory guidance behaviors of pediatric interns.

METHODS: All subjects were surveyed at baseline and 6 months. Intervention interns attended a CPS training module which included viewing an educational video, observing a car seat inspection appointment, hands-on practice and completion of a post-intervention survey.

RESULTS: All 16 intervention interns completed the initial survey, the intervention and the immediate-post questionnaire. Thirteen (81%) completed the 6-month follow-up. The baseline survey was completed by 27/40 (67%) of control interns, 28/40 (70%) submitted a follow-up. The proportion of intervention interns who self-reported giving CPS guidance at all well-child visits increased by 31.3% (95% CI 6.1,56.5%); the control group had no change. Similar results were seen with self-reported knowledge and attitude.

CONCLUSIONS: A CPS training module increases pediatric interns' knowledge, improves attitudes, and self-reported behaviors regarding CPS-related anticipatory guidance.

BACKGROUND

In the United States motor vehicle occupant injury is a significant source of morbidity and mortality for children. In 2013 an estimated 172,000 children under the age of 14 were injured, and 1,149 were killed in motor vehicle crashes.¹ Motor vehicle crashes are the leading cause of death in this age group.¹

Pediatricians play an important role in promoting child passenger safety (CPS). CPS is the only health supervision topic that is recommended at every well-child visit by Bright Futures, a preventative screening guide developed by the American Academy of Pediatrics (AAP).² Pediatricians' CPS recommendations have been shown to change parental behaviors.^{3,4} A national study found that this crucial guidance does not occur universally, with less than 30% of

parents reporting CPS counseling.^{5,6} Parental recall of anticipatory guidance during well-child visits has been shown to be high.⁷ Education provided during pediatric residency is associated with a greater likelihood that pediatricians will counsel caregivers regarding CPS.⁸ Among pediatric residents who do not counsel, 57% cited lack of information as the major barrier.⁸

The purpose of this study was to investigate the effect of a brief CPS educational intervention delivered to pediatric interns. We hypothesized that a two-hour CPS training module would increase pediatric interns' knowledge, improve attitudes, and self-reported behaviors while delivering CPS-related anticipatory guidance during well-child visits compared to pediatric trainees in comparable academic residency programs who do not receive such training.

METHODS

Study Setting and Design

A quasi-experimental study design was utilized with three academic children's hospitals serving as study sites. One site supplied the intervention group and the others the controls. All pediatric interns at these sites were invited to complete a baseline survey between month 2 and 4 of their first year of residency, and a follow-up survey approximately 6 months post-baseline. Participants were given a \$5 gift card upon completion of each survey. Intervention interns completed a survey immediately following the educational session. All surveys assessed CPS-related knowledge (correct vs. incorrect response), attitude (4 point scale, 1 = not important to 4 = very important), and behavior (5 point scale, 1 = never, 5 = always). All surveys were developed for this study by the research team which consisted of pediatricians, child passenger safety professionals as well as a survey design expert. The study was approved by the institutional review board at all institutions.

The CPS Educational Intervention

After completing the baseline survey, intervention interns attended a 2-hour CPS educational module. They watched the 1-hour AAP CPS Continuing Medical Education video⁷, followed by discussion with a certified CPS technician instructor. Intervention interns then practiced harnessing dolls in car seats and installing car seats in a vehicle or training-seat with expert feedback from one of the study authors (DM). If

possible, based on timing of appointments, interns observed a car seat inspection appointment at the hospital's car seat fitting station conducted by a certified CPS technician.

Data Collection and Analysis

All surveys were administered electronically using DatStat™ (Seattle, Washington). Participant surveys were coded with participant ID number and emailed to participants. No identifying information was collected. Data were extracted from DatStat™ into Excel, cleaned and analyzed in aggregate. The data are presented as the percent change in subjects answering correctly on the immediate post and 6 month follow-up surveys compared with baseline, with 95% confidence intervals (CI) calculated for each percent change.

RESULTS

All sixteen interns at the intervention site and all 40 interns at the control sites were invited to participate. Participation was completely voluntary and participants could drop out of the study at any time. All 16 intervention interns completed the initial survey, the educational intervention and the immediate post survey. Thirteen intervention interns (81%) completed the 6-month follow-up. The baseline survey was completed by 27/40 (67%) of interns at the control sites, 28/40 (70%) submitted a follow-up. The intervention and control groups were similar in age, experience with installing car seats, whether or not they had children and history of formal CPS training (Table 1).

Table 1. Characteristics of intervention and control groups.

	Intervention interns	Control interns	p - value
Age			
20–25	4 (25%)	3 (11%)	p = 0.23
26–30	11 (69%)	22 (79%)	p = 0.34
31–35	1 (6%)	1 (3%)	p = 0.70
36–40	0	1 (3%)	p = 0.44
> 40	0	1 (3%)	p = 0.44
Have children	1 (6%)	3 (11%)	p = 0.59
Never installed car seat	13 (81%)	20 (71%)	p = 0.59
Formal CPSa training	0	0	

^aCPS = child passenger safety

We conducted statistical tests of comparison of proportional changes pre- and 6 months post-intervention for each condition. Using a binomial test for proportions expressed as a z statistic we found that knowledge increased with the CPS intervention and was maintained over the 6-month follow-up period. Compared to baseline, 31% [95% CI 5.6, 56.1%][p<0.001] more intervention interns correctly identified the recommended criteria for transition from a rear- to forward-facing car seat both in the immediate post survey and the 6-month follow-up, while the control group demonstrated a 3.6% [95% CI 3.4, 10.6%][p>0.05] increase at 6

months. We observed changes in attitudes in the intervention group. For example, the proportion of intervention interns who agreed that booster seat use is 'very important' increased from baseline by 37.5% [95% CI 13.8, 61.2%] when measured immediately post the intervention and 29.5% [95% CI 4.7, 54.3%][p<0.05] at 6-month follow-up, compared to an increase of 1.6% [95% CI -3.1, 6.3%][p>0.05] from baseline to 6-month follow-up in the control group. I think that p values rather than confidence intervals, or both would be helpful.

The intervention also influenced behavioral intention and self-reported behaviors: the proportion of study interns who planned to give CPS guidance at all well child visits increased by 43.8% [95% CI 19.4, 68.1%] immediately post intervention and increased by 31.2% [95% CI 6.1, 56.5%] [p=0.05] from baseline to 6 months, while the control group had no change. Other practice behaviors had similar changes (Table 2). Of note, the proportion of interns in the intervention group who cited lack of confidence in their knowledge as a reason that they don't ask caregivers about CPS at each well child visit dropped from 78% at baseline to 0% immediately post-intervention and at the 6-month follow-up. In the control group this percentage increased from 31% at baseline to 64% at the 6-month follow-up.

All three components of the educational module were rated favorably by the intervention interns: hands-on practice with car seats was rated as helpful or very helpful by 100%, the AAP video was rated as helpful or very helpful by 14 of the 16 participants, and 85% thought that observing a car seat fitting station appointment was helpful or very helpful. All participants stated they were either likely, or very likely to change their clinical practice as a result of the educational module, with all stating that increased confidence in their CPS knowledge was the main reason for the change.

DISCUSSION

In this study we were able to demonstrate that a 2-hour CPS educational intervention increases pediatric interns' knowledge, improves attitudes, and changes self-reported behaviors regarding CPS-related anticipatory guidance during well child visits. The intervention produced a sustained improvement in CPS knowledge, attitude and behavior, which exceeded those changes attributable to standard training experiences at 2 control residency programs.

There were several limitations to this study. First, intervention and control subjects were not randomly selected, but by the measures used, the groups appear to be similar. While both groups denied formal CPS training, we did not account for any differences in informal messaging or training at the respective continuity clinics that may have influenced the participants' attitudes/practices at baseline or follow-up. Our data also relies on self-report, which may be biased; however, this would likely be present in both groups. Research subjects were only followed for 6 months so it is not known if the intervention effect would be seen

Table 2. Percent change from baseline in subjects answering correctly

Target Area	Intervention Group			Control Group	
	% correct at baseline	%Δ immediate post (95% CI)	%Δ at 6 months (95% CI)	% correct at baseline	%Δ at 6 months (95% CI)
Knowledge					
Transition from a RF to FF car seat	69.0%	+31.0% (8.3,53.7)	+31% (5.6,56.1)	64.3%	+3.6% (-3.4,10.6)
Use of booster seat until 4'9"	62.5%	+37.5% (13.8,61.2)	+37.5% (11.2,63.8)	57.1%	+7.2% (-2.6,17.0)
Back seat until age 13	31.3%	+62.5% (38.8,86.2)	+31.7% (6.4,57.0)	50.0%	0%
Less than one inch movement at belt path	25.0%	+68.8% (46.0,91.5)	+59.6% (32.9,86.3)	46.4%	+14.3% (1.1,27.5)
Attitude^a					
CPS anticipatory guidance at all WCCs	75.0%	+12.5% (-3.7,28.7)	+3.6% (-2.9,38.7)	64.3%	-9.2% (-20.1,1.7)
Child stays RF until 2 years	75.0%	+6.3% (-5.6,18.1)	+17.9% (-2.9,38.7)	67.9%	-1.6% (-6.3,3.1)
Booster until 4'9"	56.3%	+37.5% (13.8,61.2)	+29.5% (4.7,54.3)	53.6%	+1.6% (-3.1,6.3)
Back seat until 13 years	75.0%	+6.3% (-5.6,18.1)	+10.7% (-6.1,27.5)	64.3%	+8.1% (-2.2,18.4)
Behavior					
Give anticipatory guidance at all WCCs	18.8%	+43.8% (19.4,68.1) ^b	+31.3% (6.1,56.5)	51.7%	0%
Ask if confident car seat is installed correctly (at least some visits)	25.0%	+68.8% (46.0,91.5) ^b	+32.1% (6.7,57.5)	37.9%	+3.5% (-3.4,10.4)
Discuss when to turn from RF to FF (at least some visits)	37.5%	+62.5% (38.8,86.2) ^b	+41.1% (14.3,67.7)	79.3%	0%
Discuss booster seat use (at least some visits)	25.0%	+75.0% (53.8,96.3) ^b	+39.3% (12.7,65.9)	69.0%	-10.4% (-21.9,1.1)

CPS = child passenger safety, RF = rear-facing, FF = forward-facing, WCC=well child check; Δ = change

^aReporting attitudes noted to be "very important"

^bPlanned behavior change

beyond this time period. Finally, small sample size led to large, sometimes overlapping confidence intervals, however the percent changes observed in the study versus the control group are suggestive of an intervention effect.

CONCLUSION

A brief CPS educational intervention for pediatric interns may increase the likelihood, as well as nature, of CPS anticipatory guidance given to their clinic patients. Further investigation is needed to fully evaluate the efficacy of a CPS educational intervention with residency training programs. Further investigation of the effect of increased CPS knowledge and greater incorporation of this knowledge into clinical practice should also evaluate the effect this has on the retention of parental knowledge and change in parental behaviors around CPS.

Acknowledgments

We wish to acknowledge Brittni Henderson, CPST and Chelsea D'Angelo, CPST for performing the car-seat inspection observed by the study participants.

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Disclosures

No funding for this study was provided by National Institutes of Health (NIH); Wellcome Trust; or the Howard Hughes Medical Institute (HHMI).

No conflicts of interest are reported by any authors.

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