

Injury Prevention Education Using Pictorial Information

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ABSTRACT. *Background.* Written materials used in pediatric public health settings often exceed the reading skills of caretakers.

Objective. To compare a pictorial anticipatory guidance (PAG) sheet requiring limited reading skills to a TIPP (The Injury Prevention Program) sheet for providing injury prevention information to low-income urban families.

Design and Setting. A convenience sample of families with children treated at an urban pediatric clinic affiliated with a teaching hospital.

Methods. Parents of children ≤6 years old received either a PAG sheet or a TIPP sheet during a well-child care clinic visit; parents of children seen in the morning clinic received a PAG sheet and those seen during the afternoon clinic a TIPP sheet. All also received injury prevention counseling by a clinic nurse. The recall of injury prevention information was assessed by telephone questionnaire 14 to 28 days after the clinic encounter.

Results. We interviewed 66 parents (57% of families enrolled): 46 were in the PAG group and 20 in the TIPP group. There were no differences between groups in mean parent age, percent minority race, or percent public aid. Eighty-seven percent of PAG and 100% of TIPP parents recalled receiving an information sheet; 17% of PAG and 20% of TIPP parents could recall no specific injury topics. The mean number of topics recalled was 2.1 ± 1.5 from parents in the PAG group and 1.6 ± 1.1 from those in the TIPP group. No specific injury topic was recalled by more than half the parents in either group.

Conclusions. Recall of injury information several weeks after a clinic visit is limited. The use of PAG sheets did not improve recall; lack of literacy is not the sole cause of poor recall. Successful injury prevention counseling in this population may require comprehensive and repetitive efforts. *Pediatrics* 2000;105(1). URL: <http://www.pediatrics.org/cgi/content/full/105/1/e16>; *injury prevention, counseling, primary care.*

ABBREVIATIONS. TIPP, The Injury Prevention Program; PAG, pictorial anticipatory guidance.

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Injuries are the leading cause of death and disability during childhood. Each year, an estimated 600 000 children are hospitalized because of injuries, and an estimated 16 million more are treated in emergency departments.¹ In Chicago, among children ≤14 years old, unintentional injuries, homicides, and motor vehicle injuries are the 3 leading causes of death.² Childhood injuries disproportionately affect low-income and minority children. The injury death rates for black children for homicide, fires and burns, drowning, and pedestrian injury range from 1.5 to 5 times those for white children.³⁻⁶ There is a clear need to target injury prevention efforts to these children.

The American Academy of Pediatrics developed TIPP (The Injury Prevention Program) to prevent injuries. TIPP consists of a childhood safety counseling schedule and safety information sheets to be used in providing anticipatory guidance to parents. Using TIPP anticipatory guidance sheets helps to focus counseling on selected important injury topics with proven interventions. Most significant safety topics are reviewed at several clinic visits.⁷

The TIPP program meets the needs of many families. However, we were concerned that the parents of the children served in our primary care clinic would have difficulty in reading and understanding the TIPP sheets. The median reading level of the TIPP safety information sheets is the ninth grade. Some caretakers cannot read at that level. In a study performed at a pediatric outpatient clinic serving a low-income, predominately black population, parent-reading ability was tested and found to be in the seventh to eighth grade reading range.⁸ It has been observed that in a public health setting parent education materials often require a reading level higher than most parents have achieved.⁹

It is important that materials distributed to caretakers with lower reading levels have a clear core message delivered with simple language. Too much information, long words used in complex sentences, and technical language are confusing. To improve understanding of injury prevention information, we developed age-specific pictorial anticipatory guidance (PAG) sheets.

The PAG sheets offered information similar to that present on the TIPP sheets. The text, which accompanies the pictures is written in short, simple sentences. In addition, some of the PAG sheets included injury topics more relevant to families living in urban areas; firearm injury is addressed on all sheets

TABLE 1. Demographic and Social Characteristics

	Pictorial <i>n</i> = 46	TIPP <i>n</i> = 20	<i>P</i>
Age, mean			
Child	38 ± 22 mo	19 ± 18 mo	.004
Parent	27 ± 7 y	28 ± 10 y	.1
Minority race or ethnicity	38 (83%)	18 (90%)	.4
Public aid	37 (80%)	17 (85%)	.6
Two-parent household	24 (52%)	10 (50%)	.9

TABLE 2. Recall of Injury Prevention Information*

	Pictorial (<i>n</i> = 46)	TIPP (<i>n</i> = 20)
Sheet received	40 (87%)	20 (100%)
Items recalled	2.1 ± 1.5	1.6 ± 1.1
Fire/burns	(<i>n</i> = 46)	(<i>n</i> = 20)
Recall	43%	25%
Recall with prompt	26%	45%
No recall	30%	30%
Falls	(<i>n</i> = 46)	(<i>n</i> = 19)
Recall	43%	44%
Recall with prompt	17%	33%
No recall	39%	22%
Guns	(<i>n</i> = 46)	(<i>n</i> = 10)
Recall	22%	0%
Recall with prompt	37%	60%
No recall	41%	40%
Drowning	(<i>n</i> = 19)	(<i>n</i> = 12)
Recall	31%	22%
Recall with prompt	10%	44%
No recall	58%	33%

* No significant differences among the groups.

were included (Appendix). Topics addressed during each clinic visit were age specific, as intended with TIPP. Most PAG sheets discussed 5 or 6 topics.

Families were contacted by telephone 14 to 28 days after the clinic by a single primary investigator who was blinded to the group assignment. The parent who had been at the clinic visit was interviewed using a questionnaire designed to assess the recall of information related to injury prevention. The parent was first asked the age of their child and if they had received printed materials about injury prevention. Second, the parent was asked to describe any injury topics that had been discussed during the clinic visit or described on the printed materials. We then asked about specific injury topics that had not been initially recalled by the parent, and graded that response as recall with prompting or no recall. We also collected demographic and social information.

The primary outcome measure was the difference in recall of injury prevention information between the intervention and control groups. We used the *t* test and the χ^2 test for statistical analysis.

RESULTS

One hundred fifteen families were enrolled in the study during August and September 1997. Eleven were excluded because the telephone was disconnected between enrollment and follow-up, and 38 families could not be reached by telephone. Of the remaining 66 families (57%), 20 were in the control group and 46 were in the intervention group.

The demographic and social characteristics of the 2 groups were not significantly different except children in the intervention group were older (Table 1).

Almost all parents recalled receiving an information sheet about injuries (87% of parents in the intervention group and 100% of parents in the control group; χ^2 ; *P* < .1). When asked to state any injury topic that was discussed during the clinic visit or was on the injury information sheet, 17% in the interven-

tion group and 20% in the control group were unable to name any topics (χ^2 ; *P* < .9). Among parents in the intervention group, the mean number of topics recalled without prompting was 2.1 ± 1.5 ; parents in the control group recalled a mean of 1.6 ± 1.1 topics (*t* test; *P* < .5).

Parents were asked about specific injury topics other than those recalled; each response was graded as recall with prompting or no recall (Table 2). Because specific topics were discussed with the parents of children of particular ages, the data are shown as percentages. There were no significant differences between the intervention and control groups in the recall of information pertaining to fire/burns, falls, guns, and drowning. There was also no significant difference between groups in recall of information about poisoning, choking, and street safety. Information about elevated train safety was included only on the PAG sheet for children 4 to 6 years of age; 7% of parents could recall this information and an additional 30% could recall this information with prompting.

DISCUSSION

Our data show that most parents recall receiving printed injury prevention information during their child's primary care visit. However, their recall of specific injury topics several weeks after the clinic visit is limited: most parents recall less than half of the information they were provided. The use of pictorial information did not improve recall.

When we analyzed recall of specific injury topics, at best two thirds of caretakers could recall the topic or could recall the topic with prompting. For any single topic, we were unsuccessful in delivering injury prevention information to 30% to 58% of the parents. Our study is not unique; others have shown injury counseling to be of limited effectiveness.^{10,11} This may be because of the number or complexity of materials used. It may also be attributable to the amount of information reviewed in a short clinic visit. The parent may be concerned about growth, behavioral and developmental issues, or have some other agenda for the visit. Information to prevent injuries may have less direct relevance.

Parents want and need information to prevent injuries in their children.^{12,13} Although parents from a variety of socioeconomic backgrounds demonstrate this need, multiple social factors, including poverty and having a single, unemployed mother seem to increase injury risk.^{3,5,6} The most effective method to provide safety information is not known. A positive effect of safety education delivered in the clinical setting on knowledge and safety practices has been shown.^{11,14,15}

TIPP was developed to direct injury prevention education by clinicians. This program was thoughtfully designed, and it suggests frequent repetition of the most significant injury prevention messages. However, we were concerned that the TIPP sheets required reading skills that parents of the children treated in our primary care clinics did not have. It has been shown that in a public health clinic setting, education materials should be written at less than a

high school level if most parents are to be expected to read them. Some have suggested that health education materials be written at the fifth grade level or lower.⁹ Because most TIPP sheets require high school level reading skills, we developed pictorial injury information sheets that required minimal reading skills for use in injury prevention education in our clinic. However, in this study we did not show improved recall of injury information with the use of the pictorial sheets. This may be because the use of printed materials in the public clinic setting has a modest effect on injury knowledge, independent of the reading level of the caretaker.

Some injury prevention counseling programs seem to have been successful in changing behavior and in reducing the number of injuries.^{11,16} Additional study is needed to learn the best injury prevention methods for use with low-income families. Counseling may be more effective when it is associated with more concrete measures like environmental modification. Some have advocated the provision of safety devices such as smoke detectors at the clinic. Limited data suggest the provision of both a safety device and education results in fewer injuries.¹⁴

Visits to the home to identify household hazards have been suggested. They may be particularly useful in allowing the health care worker to point out locations where children might fall, to identify areas where burns could occur, and to demonstrate locations where medication and cleaning agents could be stored safely. Use of a simulated home environment to teach about household hazards is also under study (D. Jones, MD, personal communication).

Particular injury needs have been successfully addressed with focused interventions using a combination of strategies. Investigators in 1 community identified an area with a high rate of injuries related to residential fires and designed a smoke alarm giveaway program. The door-to-door distribution of smoke detectors was associated with an 80% reduction in the annualized fire-injury rate during the 4-year interval after the intervention.¹⁷

It is likely that a multidisciplinary approach involving office-based injury prevention counseling, hands-on instruction in a home environment or in a simulated home environment, provision of safety devices free or at a reduced charge either at the clinic or door-to-door, and a strong media message will be most effective in preventing childhood injuries. Additional work is needed to learn the most effective counseling materials for use among low-income families at risk for having poor reading skills.

Our study has several limitations. The pictorial sheets have not been formally validated, and we do not know if they were understood and conveyed the desired injury message. We were unable to reach many of the parents after the clinic visit. Because of a small sample size, there may have been significant differences between groups that we were unable to detect in both social and demographic backgrounds and in recall of injury information. However, we believe our data indicate that a single injury prevention counseling episode is of limited effectiveness in this setting and that additional work is needed to

develop effective counseling materials and to identify additional injury prevention strategies for low-income families attending primary care clinics.

APPENDIX

Age	Pictorial	TIPP
<6 mo	Falls	Falls
	Burns	Burns
	Choking	Choking
	Smoking	Car
	Drowning	
	Guns	
6-12 mo	Falls	Falls
	Burns	Burns
	Choking	Choking
	Smoking	Car
	Drowning	Drowning
	Guns	
1-2 y	Falls	Falls
	Burns	Burns
	Poisoning	Poisoning
	Drowning	Drowning
	Guns	Guns
	Lifting	Car
2-3 y	Choking	
	Falls	Falls
	Burns	Burns
	Poisoning	Poisoning
	Drowning	Guns
	Guns	Car
4 y	Lifting	
	Choking	
	Falls	Falls
	Burns	Burns
	Guns	Guns
	Street	Car
5 y	Choking	Poisoning
	Elevated train	
	Falls	Drowning
	Burns	Fires
	Guns	Guns
	Street	Street
6 y	Choking	Car
	Elevated train	Bike
	Falls	Fires
	Burns	Guns
	Guns	Street
	Street	Car
	Choking	Bike
	Elevated train	

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