Advancing Our Understanding of Mothers' Safety Rules for School-age Children

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ABSTRACT

Objective: Teaching safety rules is a common way parents attempt to moderate injury risk for elementary-school children, but few studies have examined the nature of this teaching. The present study explored whether mothers' safety rules varied with type of injury (falls, poisoning, burns and cuts), the nature of these teaching strategies about rules, and how effective these rules were to moderate children's risk behaviour when in a setting having 'contrived' hazards that were targeted by these rules.

Methods: Mothers completed an interview about safety rules, and children's behaviour was unobtrusively observed in a 'contrived hazards' situation having hazards relevant to falls, poisoning, burns and cuts.

Results: Mothers had significantly fewer rules addressing fall risks than other types of injuries, and fall-related rules were highly hazard-specific in nature, rather than aimed at teaching general principles for appraising fall risks. For all types of injuries except falls, children interacted with fewer hazards for which there were rules.

Conclusions: Rules can have preventive properties that can serve to moderate children's interacting with hazards when alone, but this seems to vary depending on the type of rule that has been taught. Given that falls are a leading cause of injury hospitalization for children and that parents are not emphasizing fall prevention as much as other types of injuries, efforts should be extended to promote parents' shifting their prevention approaches to better address this particular injury risk.

Key words: Falls; children; risk appraisals; parents

La traduction du résumé se trouve à la fin de l'article.

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Unintentional injuries are the leading cause of death for Canadian children over 1 year of age.^{1,2} Nearly 400 Canadian children die annually from injuries and thousands more are hospitalized.³ Past research indicates that parents' strategies for managing risk of injury vary with child age.^{4,5} For toddlers, parents utilize barrier and supervision strategies to limit access to hazards. As children age, however, parents shift to teaching children safety rules⁶ and they assume that children will learn these safety rules and this will ensure their safety.^{7,8} Teaching to enhance children's understanding of risks and knowledge of safety rules may be especially important in middle childhood, when it is normative to grant increasing independence and allow children to be on their own without much direct supervision.⁹ In fact, a retrospective review of the types of injuries reported for a sample of school-age children revealed that safety rules could have prevented a majority of these injuries.¹⁰ Surprisingly, although there is evidence that mothers impose rules more consistently than inconsistently for school-age children,¹¹ there is little known about the nature and scope of parent safety rules for school-age children and whether this might vary depending on type of injury risk. The present study addressed these gaps in the literature.

METHOD

Participants

The sample comprised 75 mothers of sons (n=36) and daughters (n=39) who were aged 8-10 years old (M = 8.48 years, SD = 1.51).

Participants lived in Guelph and were randomly selected from a database of 13,000 families interested in research on child development. Participation rate was 75% of the 100 families contacted. If more than one child was in the target age range for the family selected, then one was randomly selected before contacting the family to invite participation. Inclusion criteria included: two-parent households, fluent in English, the child was developing normally, and no immediate family member had been hospitalized for injury; we limited the sample to two-parent households because single parenting has been linked to increased child injury risk. Mothers were predominantly Caucasian (96%) and well educated (77% had completed a university or college degree). Family income fell within the mid to high socio-economic status range, with 66% earning \$80,000 and above. Procedures were approved by the university ethics review committee and all participants granted written consent.

Materials and method

Each mother and child visited the lab together. While the child completed a different task, the mother visited the 'contrived haz-

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Figure 1. Schematic diagram of the room showing location of the 12 contrived hazards

ards' room (see Figure 1) in which she observed 12 'hazards' that appeared realistic (i.e., potentially harmful) but that had been modified to eliminate risk of injury (e.g., kettle light was lit to suggest it was hot, but in fact it was not hot). The hazards represented four types of injuries (3 hazards each for falls, burns, cuts, poisoning). The particular hazards (*burns*: cigarette lighter, mug with a dark liquid and tea bag, kettle with light lit; *cuts*: sharp tool, box cutter, sharp letter opener with pointed tip; *poisoning*: open medication bottle, air freshener liquid, spray bottle of blue-coloured liquid in a Windex bottle; *falls*: tall stepladder, boxes arranged as potential stairs, and an open briefcase positioned high enough that it could fall on the child if s/he grabbed for it to see what was inside) were selected because they could be represented in the 'contrived hazards' room and were endorsed by a majority of parents (89%) as 'relevant to my child's safety' in a survey completed by a sample of 80 parents of children 8-10 years. The mother completed an interview about each hazard, reporting on if there was a safety rule the child had been taught for the hazard or things like it, and to elaborate what the rule was.

The child then was asked to wait alone with the door closed for 10 minutes in the contrived hazards room while the mother completed another task. There was a chair to sit on and s/he was shown books and handheld toys/games that were available. During this time, video cameras in the ceiling unobtrusively recorded the child's behaviour.

Data coding

Each mother was assigned one score per type of injury, to indicate the percentage of hazards for which she had a safety rule that the child knew. Each rule was subsequently coded by two independent coders

Table 1. Average Number of Rules and Number of Mothers Reporting at Least One Rule According to Type of Injury

Type of Injury	Average Number of Hazards With a Rule* (max. = 3.0) Mean (SD)	Number of Mothers Reporting at Least One Rule* (max. = 75 mothers)
Burns	1.39 (0.94)	69
Cuts	1.49 (0.69)	67
Poisoning	1.49 (0.69)	66
Falls	0.71 (0.78)	40

* Fewer mothers had rules for falls and the number of rules for falls was significantly less than for each of the other types of injury ($p < 0.05$)

(% agreement = 97%) and assigned to the most appropriate category or type of rule, including: 'hazard avoidance' rule (i.e., a rule that did not aim to teach the child about risk but to prevent interacting with a particular object or class of objects, e.g., 'no touching cigarette lighters of any kind'), 'controlled access (supervisor present)' rule (i.e., the child could interact with the hazard when a supervisor was present), a 'touch with care' rule (i.e., the child could independently interact with the hazard but was expected to do so carefully to prevent injury), or a 'teaching about risks' rule that aimed to teach the child about injury risks and how to evaluate these (e.g., *Don't climb up on things because you could hurt yourself badly if you fell off and hit something hard or sharp*); each rule was assigned to only one category. To assess whether children were less likely to interact with hazards for which the parent reported a safety rule, each child was assigned a score depending on whether or not they touched each of the hazards for which their mother had a rule (maximum = 12).

Analyses

To determine whether the percentage of rules varied with type of injury, Analysis of Variance (ANOVA) was conducted on the percentage of rules that addressed burn, cuts, fall and poisoning hazards, with Sex (2) as a between-participants factor and Injury Type (4) as a within-participants factor. To determine whether types of rules varied with type of injury, an ANOVA with Sex (2) as a between-participants factor and Injury Type (4) and Type of Rule (4) as within-participants factors was conducted. When follow-up paired-constrasts were conducted, a Bonferroni correction was applied in assessing for significance. Finally, to examine whether having a rule was associated with fewer hazard interactions, binomial tests were conducted in which the exact probability of a child not interacting with a hazard given that there was a rule addressing that hazard was determined.

RESULTS

Did the percentage of parent safety rules vary with type of injury?

Results revealed only a main effect of Injury Type [$F(3, 71) = 17.81$, $p < 0.01$, $\eta_p^2 = .43$]. Paired-comparison tests indicated mothers had fewer rules for fall hazards compared to cuts, burns and poisonings ($p < 0.05$), which did not differ from one another. Not only were there fewer rules for falls, but fewer parents had rules for falls (see Table 1).

Did the types of safety rules that parents used vary with type of injury?

Mothers communicated different types of rules for different types of injuries, $F(9, 29) = 3.19$, $p < 0.05$, $\eta_p^2 = .60$, and no sex differences

Table 2. Total Number of Rules and Average Percent of Each Type of Rule, as a Function of Type of Injury

Type of Injury	Total Number of Rules*	Type of Rule			
		% Teaching About Risks†	% Hazard Avoidance‡	% Controlled Access (Supervisor Present)§	% Interact with Caution§
Burns	104	26	40	23	11
Cuts	112	28	44	22	6
Poisoning	99	31	41	17	11
Falls	53	2	76	20	2

* For each type of injury, the maximum number of rules possible is 225 (i.e., 75 mothers x 3 hazards for which there potentially was a rule).

† Falls was significantly less than each of the scores for the other types of injury ($p < 0.05$).

‡ Falls was significantly greater than each of the scores for the other types of injury ($p < 0.05$).

§ There were no significant differences across type of injury.

occurred. Type of injury scores was examined separately for each type of rule (see Table 2). There was no significant variation across type of injury for 'touch with care' rules or 'controlled access (supervisor present)' rules. However, the extent to which mothers used 'teaching about risks' rules [$F(3, 26) = 5.17$, $p < 0.01$, $\eta_p^2 = .37$] and 'hazard avoidance' rules [$F(3, 26) = 7.74$, $p < 0.01$, $\eta_p^2 = .47$] each varied with injury type. Paired comparison tests revealed that 'teaching about risks' rules occurred less for falls compared with each of the other types of injuries ($p < 0.05$); there was no difference across burns, cuts or poisoning. In contrast, 'specific hazard avoidance' rules occurred more frequently for falls than for other types of injuries ($p < 0.05$); there was no difference across burns, cuts or poisoning.

Were children less likely to touch hazards for which there were rules?

As shown in Table 3, rules were associated with significantly fewer hazard interactions for burns ($p < 0.001$), poisoning ($p < 0.001$) and cuts ($p < 0.001$) but not for falls ($p = 0.21$); again, there were no sex differences in results. The same pattern of significant results were obtained when Chi Square tests were conducted on the number of hazards children did and did not touch relative to whether or not their parent had a safety rule prohibiting hazard interactions ($p < 0.05$ for all types of injury except falls).

DISCUSSION

The present findings have important implications for injury prevention. Past research with parents of pre-school children indicates that parents are generally unaware of the scope of childhood injuries¹² and they believe that falls are normative events that are not preventable or a concern.⁷ These findings could explain why mothers in this study had the fewest rules for fall risks, despite the fact that falls are the leading cause of injury hospitalization for children at these ages. Given recent findings that parents' commitment to enact more injury prevention strategies is enhanced by improving their knowledge of childhood injuries and perceptions of children's vulnerability for injury,¹³ raising awareness of the frequency and severity of fall injuries may promote greater injury prevention efforts by parents.

The findings also reveal important variation in the nature of the rules used as a function of type of injury. Enacting rules that emphasize teaching children to appraise risks was more common for cuts, burns and poisoning than for falls. In contrast, the predominant type of rule for falls emphasized *avoidance* of a *particular* hazard. Given that rules did not seem to moderate children's interacting with fall hazards as well as they did for the other types of injuries, an emphasis on teaching risk awareness and appraisal may

Table 3. Number and Percent of Hazards That Children Interacted With for Which Mothers Had a Safety Rule Aimed at Preventing Interactions, as a Function of Type of Injury

Type of Injury	Total Number of Rules*	Did Child Interact With the Hazard Even Though There Was a Rule?	
		% Yes†	% No
Burns	104	10	90
Cuts	112	12	88
Poisoning	99	11	89
Falls	53	45	55

* For each type of injury, the maximum number of rules possible is 225 (i.e., 75 mothers x 3 hazards for which there potentially was a rule).

† The % hazard interactions was significantly higher for falls than for each of the other types of injury ($p < 0.05$), indicating that rules were not as effective to prevent fall-hazard interactions.

be more effective at influencing children's behaviour than rules that are narrow in scope and unlikely to generalize to novel hazards or situations. Although it can be more effortful to communicate information about risk appraisal than to implement directives about specific behaviours and hazards, the latter are more restrictive than the former and, therefore, less generalizable. Moreover, prohibitions of specific behaviours or child-object interactions leave the onus on the child to determine what the issue is that has resulted in the prohibition, and the child may draw erroneous conclusions that have little to do with safety (e.g., think the issue is about cleanliness or breakage of an object, rather than safety). Making parents aware of these findings may facilitate their implementing more informative safety rules that bridge to teaching about what the risk considerations are so that the child can apply this knowledge across novel situations and hazards and become better prepared to make 'smart' risk decisions when a supervisor is not present.

Limitations and future research

Several limitations should be addressed in future research. First, the sample is fairly homogeneous in demographic characteristics; extending it to include greater diversity in income, ethnicity and education would be an important next step. Second, although mothers endorsed the hazards as relevant to their child's safety, only a small sample of potential hazards were reported on; expanding these listings to sample more broadly is important. Third, interviewing mothers to understand their rationale for having and not having rules is important in order to determine what kinds of messages might work to foster greater implementation of safety rules. Finally, it would be useful to extend this research by examining how child and parent characteristics impact the findings. For example, permissiveness in parenting predicts less effective teaching about safety rules, which elevates children's risk of injury.¹⁴ How-

ever, detailed examination of the nature of permissive parents' rules has not been considered but could be important. Similarly, children high in behavioural inhibitory control are more likely to comply with rules, but whether and how this influences parents' safety rules has not been examined (e.g., maybe parents provide fewer explanations about safety if children are dispositionally compliant with rules). Generally, although much is known about how parents teach children in areas relevant to school performance,¹⁵ surprisingly few studies have examined parental teaching about safety and injury risks and how this relates to children's risk of injury.

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RÉSUMÉ

Objectif : C'est en leur enseignant les règles de sécurité que les parents d'enfants fréquentant l'école primaire essaient en général de modérer les risques qu'ils se blessent, mais peu d'études se sont penchées sur la nature de cet enseignement. Nous avons voulu déterminer si les règles de sécurité des mères variaient selon le type de blessure (chutes, empoisonnements, brûlures et coupures) et étudier la nature de leurs stratégies d'enseignement et l'efficacité des règles pour modérer la propension des enfants à prendre des risques dans un lieu semé de dangers « artificiels » correspondant aux règles.

Méthode : Les mères se sont prêtées à un entretien sur les règles de sécurité, et le comportement de leurs enfants a été observé discrètement dans une situation de « dangers artificiels » correspondant aux chutes, aux empoisonnements, aux brûlures et aux coupures.

Résultats : Les mères avaient beaucoup moins de règles sur les risques de chute que pour les autres types de blessures, et les règles liées aux chutes étaient très précises plutôt que d'enseigner des principes généraux permettant d'évaluer les risques de tomber. Pour tous les types de blessures sauf les chutes, les enfants ont interagi avec un moins grand nombre de « dangers » contre lesquels il existait des règles.

Conclusion : Les règles peuvent avoir un effet préventif qui modère les interactions des enfants avec les dangers lorsqu'ils sont seuls, mais cela semble varier selon le type de règles enseignées. Étant donné que les chutes accidentelles sont l'une des principales causes d'hospitalisation pour blessures chez les enfants, et que les parents n'insistent pas sur la prévention des chutes autant que sur les autres types de blessures, il faudrait faire des efforts pour encourager les parents à modifier leurs approches de prévention afin de les axer davantage sur ce risque de blessure en particulier.

Mots clés : chutes accidentelles; enfant; évaluation du risque; parents