ABSTRACT

Responding to a gap in existing programs that aim to prevent spinal cord and brain injuries among children, an interactive activity-based program was developed and implemented through local elementary schools, focusing on children 8 to 10 years of age. Evaluation involved a pretest/post-test design with a comparison group who had not experienced the program. Children who participated in the program showed increases in knowledge, self-reported changes in behaviour, and favourable shifts in attitudes about vulnerability to injury four months after exposure to the program. Control group children responded similarly to how children in the intervention group responded on the pretest measure.

ABRÉGÉ

En réponse aux lacunes que présentent les programmes existants dont l'objectif est la prévention de blessures à la colonne vertébrale et au cerveau chez les enfants, nous avons élaboré un programme interactif à base d'activités destiné aux enfants âgés de 8 à 10 ans et l'avons mis à l'essai dans des écoles élémentaires locales. L'évaluation consistait en un pré-test et en un post-test et mettait en jeu un groupe de comparaison n'ayant pas participé au programme. Quatre mois après leur participation au programme, les enfants avaient de meilleures connaissances, rapportaient des changements dans leur propre comportement et avaient de meilleures attitudes sur la vulnérabilité aux blessures. Les enfants du groupe de contrôle avaient des réponses semblables à celles qu'avaient données les enfants du groupe d'intervention pendant leur pré-test.

Prevention of Paediatric Acquired Brain Injury: An Interactive, Elementary-School Program

Barbara A. Morrongiello,¹ Jennifer Miron,² Rhonda Reutz²

In the United States and Canada, as in many other industrialized nations, unintentional injuries are the number one cause of death for children beyond one year of age, and a leading cause of visits to emergency departments.¹⁻³ Each year in the United States approximately 422,000 people suffer head injuries,⁴ with about one third of these injuries occurring to children and adolescents.⁵ Head and spinal cord injuries among youth most often result from their being unrestrained in motor vehicle crashes, falling from heights, and diving in unsafe places, with males being more likely than females to experience such injuries.⁶ In addition to the catastrophic effects of such injuries on the lives of individuals and their families, the average lifetime costs of such injuries is estimated to be 1.2 million dollars per individual.⁷ Accordingly, many educational intervention programs have been developed to prevent head and spinal cord injuries; most programs aim to reduce both spinal cord and head injuries due to similarity in the causes of injury and demographic characteristics of those who experience such injuries.

Richards⁸ conducted a survey of programs on prevention of spinal cord and/or brain injury in Canada and the United States and identified 146 local and state programs, however, the efficacy of such programs is largely unknown.⁹ Moreover, those that have been evaluated typically show no¹⁰ or mixed results,^{11, 12} often producing changes in knowledge but not in

children's reported injury-risk behaviours.¹³ Although a good case can be made that children's health-relevant attitudes and behaviour patterns are established early in life,¹⁴ the vast majority of programs to prevent brain and spinal cord injuries focus on junior- and high-school-aged children because these are the ages at which these types of injuries more often occur. Indeed, we could find only one program that was directed towards pre-adolescent children and had been formally evaluated. Richards and his colleagues developed a spinal cord injury prevention program that teachers implemented in the classrooms of first, third and fifth graders.¹⁵ Cartoon characters were used to convey curriculum content (falls and playground safety, bike safety, safe diving, vehicle safety). A pretest/post-test design with a comparison group was used to determine efficacy of the program. Evaluation results revealed that children exposed to the program showed a significant increase in knowledge of spinal cord injury and its prevention, however, there were no changes in behaviour, even in self-reported use of safety belts.

To further address the gap in prevention programming for younger children, the present study involved the development, implementation, and evaluation of a program that was directed toward 8-10 year olds. The program was identified as the GET AHEAD program (i.e., gearing everyone to act healthy each day), and it comprised a pre-session during which the teacher and project coordinator prepared the children for participation in the program and assessed their knowledge of brain functioning and self-reported safety promotion behaviours; a program-delivery session that emphasized activity-based learning experiences; and a post-session during

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which the post-test questionnaire was given.

The specific goals of the program were to *increase knowledge* of causes and consequences of brain injuries and how to prevent such injuries, *alter attitudes* about personal vulnerability for injury risk, and *increase self-reported safety behaviours*. Drawing on the results of an extensive review of the literature to identify characteristics of efficacious injury-prevention programs directed towards younger children,¹⁶ an interactive or participatory emphasis was adopted in the program. Specifically, the information was delivered in ways that involved children participating in activities that encouraged them to draw their own inferences, develop their own explanations (e.g., identify cause-effect relations) and reach their own conclusions regarding the potential for injuries to occur, the effects of such injuries on one's life, and ways one could behave to reduce the risk of such injuries occurring while still achieving one's play goals of having fun.

The importance of emphasizing children's active engagement with the materials also derived from educational-based research on children's learning and memory processes. The assimilation of new information with existing knowledge (i.e., learning) is facilitated when students actively construct what they are learning. For example, "self explaining" (i.e., generating examples for oneself as one attempts to learn new information) has been shown to be quite effective in improving learning and the acquisition of problem-solving skills.^{17,18} Similarly, children's learning and mastery of information has been shown to be significantly improved if they are encouraged to give or elaborate on explanations to others, as opposed to simply receiving explanations.^{19,20} A variety of sources suggested that an activity-based program that encouraged children to construct their knowledge would serve to maximize program effectiveness.

METHOD

Subjects

Participants included 96 children (47 girls, 49 boys) in the intervention group

(exposed to the program) and 36 children (19 girls, 17 boys) in the control group ($M = 9$ years of age in both groups; range: 7.5 - 10 years). Children were recruited from the same four schools in Toronto to maximize comparability across groups and provide a mixture of lower and middle socioeconomic status students. All children were in regular classrooms and were fluent in English. Children in intervention and control groups scored similarly on reports of injury-related visits to doctor's offices (approximately 79% of sample) and to emergency departments (approximately 78% of sample) for themselves or someone close to them (e.g., siblings).

Materials

Program Materials

During the pre-session, which occurred in the classroom one week before program delivery, children completed the pretest questionnaire and teachers then reviewed some terms that would be mentioned in the program (e.g., prevention, safety, risky, brain), some facts about the head (e.g., skull, fluid, brain), why the brain is important (e.g., for walking), and discussed the distinction between accidents and injuries. The teachers were provided diagrams of the brain and accompanying fact sheets to guide their classroom discussions and ensure that the same material was covered and to the same degree of specification across classrooms; the project coordinator was present during the pre-session.

Following this discussion, children participated in activities to provide them with an appreciation of the consequences of injury to the brain. For example, they used one hand only in attempting dress-related and everyday activities (buttoning, zipping, tying shoelaces, using a knapsack), noting how long it took to accomplish tasks, the need for assistance from other people for some tasks, the difficulty with being on time for class or recess when doing these activities at school. Other activities simulated visual and hearing disabilities, fine motor problems, and limitations in use of the non-dominant hand. To facilitate the administration of these activities and ensure uniformity in procedures across classrooms, the project coordinator was present throughout these activities.

The program-delivery session comprised four activity-based stations, each of which emphasized different safety topics, namely bicycle safety, sports safety, vehicle safety, and general safety issues. All children attended each station, with order randomized across children. Program delivery at each station was provided by trained facilitators, with the same facilitators delivering the program across all participating schools. At each station, children began with a 10-minute exercise that was expected to serve as a review and to reinforce what they had recently learned about brain functioning during the pre-session. For example, at the bicycle safety station, children began by playing Simon Says which involved doing actions demonstrating balance and coordination required for activities like bicycling and controlled partly by the parietal lobes.

Finally, children received station-specific content information about safety, presented in an interactive and individualized format. At the bicycle safety station, they mounted a bike and learned about proper sizing of a bike and the importance of safety gear (horn, light, helmet), tried on different sizes of helmets, learned about proper fit of a helmet, discussed why children might not want to wear a helmet and why they should do so, and engaged in hands-on activities (e.g., Playskool bicycle figures, cars and laminated road drawings) to help them learn the rules of the road (e.g., ride with traffic and not against) and practice problem solving in bicycling contexts (e.g., what to do about turning cars).

At the sports safety station, children played an interactive board-type game with the facilitator. In playing the game, children were involved in identifying injury hazards for different sports, safety equipment to minimize injury in each sport, determining safe and unsafe places in which to engage in the sport, and discussing how to have fun safely while showing good sportsmanship (e.g., never hit a person from behind or play so you put them at risk for injury).

At the general safety station, children worked as part of a group to create a safety banner that was later hung in the entrance of the school. Prior to working on the banner, children discussed a number of safety

TABLE I

Control group, pre- and post-intervention data showing the percentage correct scores for children's knowledge of safety facts and safety gear, and the percentage of children (N = 96) reporting they never (N), sometimes (S), usually/always (U/A) engage in risky behaviour (Risky), worry about getting hurt (Worry) and get hurt (Hurt).

Group	% Correct Safety Facts	% Correct Safety Gear	N	Risky S	U/A	N	Worry S	U/A	N	Hurt S	U/A
Control	55 (13)*	64 (5)	25	50	25	44	31	25	0	93	7
Intervention Pretest	58 (16)	69 (11)	26	50	24	36	28	36	7	77	16
Post-test	89 (12)	84 (7)	24	66	10	3	55	42	8	83	9

* Standard deviations are indicated in parentheses.

issues with the facilitator, including: the use of 911, safety practices when strangers are evident (e.g., not opening the door), sun sense (e.g., use sun screen), and safe swimming practices (e.g., check depth before diving).

At the vehicle safety station, children participated in activities to provide practice in good decision making and reasoning about risk through role playing. Using child-size props, they practised crossing at intersections, implementing cycling rules, and car safety practices (e.g., seat belt usage). In the context of these activities, they also discussed other factors (e.g., rainy weather, lack of a crosswalk, malfunctioning traffic light) that might influence their decision making.

During the post-session, children completed the post-test questionnaire under their teacher's supervision.

Evaluation Materials

The pretest questionnaire* was organized into three sections. The first section assessed children's injury-relevant experiences, including their self reports on how often they: engage in risky play behaviour that could result in injury, worry about injury during play, get hurt during play, and engage in safety promotion behaviours (helmet usage, seat belt usage) when travel-

ling near home. The second section was a nine-item true/false quiz to assess their knowledge of safety practices (e.g., helmet should not fit loosely) and brain functioning (e.g., brain injury can result in permanent disabilities). The third section assessed their knowledge of safety gear for seven sports (i.e., ice skating, rollerblading, skateboarding, street hockey, bicycling, football, and boating) by providing a list of safety gear and asking them to indicate which gear one needed to use for which sports.

The post-test was identical to the pretest and was administered in the same way.

Procedure

Program Delivery

The program was delivered in the gym for participating classrooms; teachers agreed not to discuss the program with non-participating teachers because control group subjects came from these classrooms. The program was implemented by trained volunteers, with the same volunteers used across schools and the project coordinator attending the sessions to ensure uniformity in delivery at the different schools. Children visited each of the four safety stations; the order of visitation sites varied randomly across children and schools.

Program Evaluation

The pretest was administered in the winter months, the post-test four months later in the spring. Control group participants completed the post-test at the same time; there was no pretest measure for the control group. We originally planned to test

the control group at both times but financial and practical constraints prevailed and we were forced to limit testing only to the post-test time.

RESULTS

Knowledge

Two proportion correct scores were computed, one based on children's responses to the nine safety-facts questions and the other based on their responses to the seven safety-gear questions. Table I shows the percentage of correct scores for knowledge of safety facts, averaged across the nine questions. As can be seen, children in the control group scored similarly to the pretest scores of children in the intervention group, averaging about 55 to 58% correct. However, children in the intervention group earned an average score of 89% correct on their post-test, which was a significant improvement relative to pretest knowledge level (Bonferroni $t(190) = 15.47, p < 0.001$). In fact, an Analysis of Variance test applied to each question separately, with time of evaluation as a within-subjects factor, revealed a significant increase from pretest to post-test scores for *every* question ($ps < 0.05$, alpha level corrected).

For knowledge of safety gear, pretest scores of children in the intervention group were comparable to control group scores ($p > 0.05$), averaging about 65% to 69% correct (see Table I). However, intervention group scores increased to 84% on post-test, which was a significant improvement in knowledge of safety gear

* Regarding reliability and validity, test-retest reliability (2-week interval) was 0.74 for a sample of 45 8-year-olds and content validity was established by consulting with professionals in a variety of disciplines (child psychologists, physicians, sports coaches, public health nurses) about test items.

(Bonferroni $t(190) = 12.08, p < 0.001$). Moreover, an Analysis of Variance test applied to each question (i.e., sport) separately, with time of evaluation as a within-subjects factor, revealed a significant increase from pretest to post-test scores for *every* question about safety gear to use for different sports ($ps < 0.05$, alpha level corrected).

Attitudes

Children's attitudes about vulnerability for injury also were influenced by the intervention. Table I gives their responses to questions about how often they engage in risky behaviour during play, worry about getting hurt, and actually get hurt. The response patterns for control group participants are similar to those shown by the intervention group on their pretest measure and McNemar tests therefore did not reveal significant differences. However, a comparison of pretest and post-test responses by the intervention group revealed several interesting changes in response patterns that indicate attitudinal shifts.

For children's reporting on how often they worry about injury outcomes (i.e., perceived vulnerability), one can see in Table I that there were systematic shifts in responding from the pretest to the post-test. Specifically, fewer children reported they 'never' worry about injuries occurring and more children reported they now 'sometimes/usually/always' worry about injury outcomes, which reflected statistically significant changes in responding (McNemar test statistic = 5.76, $p < 0.05$, alpha level corrected). Consistent with this increase in perceived vulnerability for injury, there was a trend for children to report behaviour implying more cautiousness, that is, less risk taking. Specifically, for engaging in risky behaviour, one can see in Table I a trend toward fewer children reporting they do this 'usually/always' (drop from 24% to 10% of the children), and a concomitant increase in children reporting they do this 'sometimes' (increase from 50% to 66% of children), although these trends did not reach statistical significance when a McNemar test was applied. Consistent with children reporting less injury-risk behaviour following the intervention, chil-

TABLE II
Control group, pre- and post-intervention data showing the percentage of children (N = 96) reporting they never (N), sometimes (S), usually/always (U/A) use a helmet when bicycling or rollerblading and a seat belt when going a short distance from home.

Group	Helmet-Bicycling				Helmet-Rollerblading				Seat Belt Use			
	N	S	U/A	NA*	N	S	U/A	NA	N	S	U/A	NA
Control	6	25	69	0	6	25	50	19	0	13	87	0
Intervention												
Pretest	15	16	62	7	17	15	45	23	0	12	87	1
Post-test	3	8	83	6	6	7	65	22	1	2	95	2

* These numbers indicate the percent of children reporting that the activity in question was not applicable to them because they did not engage in the activity.

dren's reporting of how often they get hurt showed a similar declining trend (note drop from 16% to 9% for 'usually/always' get hurt in Table I).

Self-reported safety behaviours

Finally, children's self reports on safety behaviours changed following the intervention program. As shown in Table II in the intervention group, there was a drop in the percentage of children who 'never/sometimes' wear a helmet when bicycling and a concomitant increase in the number of children who 'usually/always' do this, and these changes were statistically significant (McNemar statistic = 32.45, $p < 0.05$, alpha level corrected). For wearing a helmet while rollerblading, there also was a decline in the number of children who 'never/sometimes' do so and a concomitant increase in those who reported doing this 'usually/always', which was a statistically significant increase (McNemar statistic = 15.79, $p < 0.05$, alpha level corrected). For seat belt usage, because there was such high reported compliance in performing this behaviour 'usually/always' even at pretest, there was little possibility of statistically significant improvement in this behaviour (see Table II). Consequently, although children in the intervention group improved (87% to 95% of children), this change did not reach statistical significance.

DISCUSSION

Prior research on the effectiveness of programs that sought to reduce spinal cord and brain injuries among children has

revealed fairly mixed results.⁹ A common finding is that programs result in increases in children's knowledge but little change in children's self-reported safety promotion behaviours.^{13,15} Changes in knowledge may result in changes in behaviour and, consequently, a reduction in injury rates; however, until this sequence of events is substantiated, changes to children's injury-risk behaviour per se probably should serve as the yardstick for judging efficacy of injury prevention programming. The prevention program evaluated in this study was effective in altering children's self-reported injury-risk behaviours, and also produced several other favourable results: it resulted in significant increases in children's knowledge of brain functioning and general safety practices, and there was evidence to suggest attitudinal shifts in children's perceived vulnerability for injury. In the present study, there were no significant changes in seat belt usage, but this probably was because usage approached near-ceiling levels even prior to the intervention. Children's reported helmet usage while bicycling and rollerblading, however, both showed significant increases. Although the domains of behaviour sampled in this study were limited (i.e., bicycling, rollerblading, seat belt usage), and children's behaviours with respect to a number of activities that represent common sources of brain injury (e.g., diving, falling from heights) were not assessed, the present program would seem to hold promise for reducing injury-risk behaviours among elementary school children.

The format emphasized in the present program was a participatory or interactive

one. This format comprised involving children in activities that would provide them experiences by which they could draw inferences and generate conclusions that were expected to influence their knowledge, attitude about personal vulnerability, and injury-risk behaviours. The selection of this format was based on a review of the childhood injury-prevention literature,¹⁶ which revealed that this feature was one that distinguished effective from ineffective injury-prevention education programs.

Another feature that characterized the present program, and followed from the participatory nature of the activities, was an emphasis on individualized interpretation of the material and construction of knowledge. Children's organization and processing of the material and determination of explanations and conclusions were guided somewhat by the facilitators at each station, but the children were nonetheless strongly encouraged to formulate their own conclusions and explanations and to state these in their own terms. This contrasts sharply with a model of children's learning that emphasizes providing them the answers directly (e.g., safety rules) and dictating the manner in which these are presented during learning opportunities (e.g., in a list format or by an adult stating these). It is acknowledged that the present approach may prove to be of limited utility with very young children due to their more limited reasoning abilities.²¹ Nonetheless, the approach was obviously effective for elementary school children age 8 years, yielding results consistent with research in educational and cognitive psychology,²¹ as well as behavioural therapy,²² which indicates that activities that encourage children's elaboration and organization of material promotes learning and memory.

Although the results that followed this intervention were quite positive, several limitations of the present study should be acknowledged and considered when designing future research on this topic. First, practical constraints necessitated that we limit our focus to self-reported injury-risk behaviours. Although this practice is common in research that focuses on brain and spinal cord injury prevention, ideally, one should measure behaviour directly to determine program effectiveness. In

defense of our findings and conclusions about program effectiveness, we would emphasize that even though most programs in this area have used self-reported behaviours, they have *not* obtained positive effects, whereas ours did. Moreover, the lack of ceiling effects in children's self-reported safety promotion behaviour on follow-up provides indirect support for the validity of our results and argues against the notion that our effects simply reflect children's biases in reporting. Nonetheless, direct measures of behaviour would have provided the strongest index by which to judge program effectiveness in the present study. In future research it would be useful also to measure both self-reported and actual behaviour so that the correspondence between these can be established. Second, in future research it would be useful to expand the design to incorporate an immediate as well as long-term retention measure in order to examine the persistence of effects over time. We focused only on a four-month retention interval, assuming this would provide a more conservative test of program effectiveness than an immediate retention test. However, an immediate retention measure might have revealed stronger effects of the program initially and that effects diminished over time reaching the level we observed four months following the program. Third, related to the matter of study design, ideally we would have liked to have tested the control group at both the pretest and post-test times. Although practical limitations prevented this and limited us to only a post-test measure, future research should incorporate this design feature. Finally, the issue of the cost of the program merits mention and needs to be weighed relative to the effects resulting from the program. This is a labour-intensive program to implement. Although we obtained encouraging results, in future research it would be important to measure injury rates directly, in order to more thoroughly determine program cost-effectiveness.

In conclusion, the present results suggest that a program that uses a participatory format with activities to promote children's reasoning about causes, consequences, and prevention of injuries can produce favourable changes in children's

knowledge, attitude about vulnerability for injury, and self-reported changes in some injury-risk behaviours. If interventions such as this one were repeated during the course of a child's development, effectiveness might be enhanced even further, particularly in areas that are generally resistant to change, such as individual attitudes. To the extent children's health attitudes and behaviours develop *throughout* childhood, repeated exposure to prevention messages would certainly seem more likely to produce long-term positive gains than one-time programs. Moreover, applying a cognitive-development framework suggests that age-related changes in children's ability to understand and reason about events in their world might make certain prevention approaches more effective than others at different ages. It would be most informative in future research to address questions such as how the format, frequency of delivery, and timing (i.e., with respect to children's developmental level) of children's prevention programming influences internalization of program messages and long-term efficacy with respect to safety-relevant attitudes and adopting safety-promotion behaviours.

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REFERENCES

1. Baker S, O'Neill B, Karpf R. *The Injury Fact Book*. Lexington, MA: Lexington Books, 1984.
2. Canadian Institute of Child Health. *The Health of Canada's Children* 2nd edition. Ottawa, Ontario: CICH Press, 1994.
3. Wilson M, Baker S, Teret S, et al. *Saving Children: A Guide to Injury Prevention*. NY: Oxford, 1991.
4. Kalsbeek W, McLaurin R, Harris B, Miller J. The national head and spinal cord injury survey: Major findings. *J Neurosurgery* 1980;53:19-31.
5. Kraus J, Black M, Hessol N, et al. The incidence of acute brain injury and serious impairment in a defined population. *Am J Epidemiol* 1984;119:186-201.

6. Stover S, Fine P. *Spinal Cord Injury: The Facts and Figures*. Birmingham, AL: University of Alabama at Birmingham Press, 1986.
7. National Spinal Cord Injury Association. *National Spinal Cord Injury Facts*. Newton, MA: NSCIA, 1987.
8. Richards JS. *Resources: A National Directory of Spinal Cord Injury Prevention Programs*. Birmingham, AL: University of Alabama at Birmingham Press, 1990.
9. Reynolds J, Nyberg J. Developing motor vehicle occupant protection programs in local health departments. *Health Educ Q* 1984;11:159-70.
10. Wright M, Rivara F, Ferse D. Evaluation of the Think First head and spinal cord injury prevention program. *Injury Prevention* 1995;1:81-85.
11. Frank R, Bouman D, Cain K, Watts C. A preliminary study of a traumatic injury prevention program. *Psychology and Health* 1992a;6:129-40.
12. Frank R, Bouman D, Cain K, Watts C. Primary prevention of catastrophic injury. *Am Psychol* 1992b;47:1045-49.
13. Englander J, Cleary S, O'Hare P, et al. Implementing and evaluating injury prevention programs in the traumatic brain injury model systems of care. *J Head Trauma and Rehabilitation* 1993;8:101-13.
14. Tinsley B. Multiple influences on the acquisition and socialization of children's health attitudes and behaviour: An integrated review. *Child Dev* 1992;63:1043-69.
15. Richards JS, Hendricks C, Roberts M. Prevention of spinal cord injury: An elementary education approach. *J Paediatr Psychol* 1991;16:595-609.
16. Morrongiello BA. Preventing unintentional injuries among children. In: *Health in Canada* (Vol 1: Children and Youth, pp. 175-232). Ottawa: Editions Multimondes, 1997.
17. Chi M, Bassok M, Lewis M, et al. Self explanations: How students study and use examples in learning to solve problems. *Cognitive Science* 1989;13:145-82.
18. Chi M, DeLeeuw N, Chiu M, LaVancher C. Eliciting self-explanations improves understanding. *Cognitive Science* 1994;18:439-77.
19. Russell D, Kelley L. *Using IDE in instructional design: Encouraging reflective instruction design through automated design tools*. Paper presented at the Annual Conference of American Educational Research Associates. April 1991.
20. Webb N. Peer interaction and learning in small groups. *Int J Educ Res* 1989;13:21-29.
21. Siegler R. *Children's Thinking*. Englewood Cliffs, NJ: Prentice Hall, 1991.
22. Jones R, Ollendick R, McLaughlin K, Williams C. Elaborative and behavioral rehearsal in the acquisition of fire emergency skills and the reduction of fear of fire. *Behaviour Therapy* 1989;20:93-101.

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1112-409 Granville St., Vancouver, BC V6C 1T2
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