Increasing Vehicle Restraint Use and Preventing Injuries Through Theory-based Educational Programs

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Abstract

Vehicle crashes are the leading cause of traumatic brain and spinal cord injuries, which could be largely prevented with correct use of vehicle restraints. Three educational programs of the ThinkFirst National Injury Prevention Foundation use theory-based methods to break through the mind-set of invincibility among children, youth, teens and even parents.

Based on Rosenstock's time-tested Health Belief Model, programs utilize both science-based curricula and people who have been injured to share their personal testimony in teaching the realities of traumatic injuries and the importance of preventing them.

Studies of students participating in ThinkFirst For Youth and ThinkFirst For Teens programs demonstrate an increase in attitudes and stated behaviors related to use of vehicle restraints. In addition, observed behaviors in a study implementing ThinkFirst For Kids and parent education demonstrated an increase in use of booster seats among 4-8 year olds.

Study Overview #1: Educational Program for Grades K-3

Boost 'em Up Research and Demonstration Project (Nov. 2006)

ThinkFirst National Injury Prevention Foundation

- October 2003, the National Highway Traffic Safety Administration (NHTSA) awarded the ThinkFirst Foundation a 3-year grant to develop and evaluate interventions designed to increase booster seat use, safety belt use and back-seat placement of 4-to 8-year-old children in vehicles.
- The project, titled Boost 'em Up, was conducted in 25 schools at ThinkFirst chapters in 4 states involving more than 13,000 students in grades K-3 classrooms. Schools were carefully selected to represent diverse populations.
- Standardized ThinkFirst lessons were taught twice per year for 3 consecutive years. Teacher and parent educational components were delivered each year.
- Three of the 4 project sites implemented booster seat distributions and other community interventions such as pediatrician education and based outreach.

Methodology

Study Overview #1, cont.

- Boost 'em Up was designed as a longitudinal, non-randomized, intervention trial using a convenience sample of demonstration sites and schools.
- Lessons were presented in both assembly and classroom formats and were administered by a health care professional, educator or child passenger safety technician. Educational tools included videos, handouts, lessons and games, anatomical models, growth charts, height measuring activities, educational folders, booster seat demonstrations and rewards.
- A total of 6 observational surveys, from February 2004 to May 2006 were conducted by trained observers at each of the 25 schools throughout the 3- year program to measure overall impact of the program, including booster seat use and safety belt use.
- Observational studies were conducted by teams of two trained observers as students were dropped off at school. Survey instruments featured a multitude of cells for recording restraint type, seating location, driver belt use, and other demographics.

Results

Study Overview #1, cont.

Restraint Type by Time								
Restraint Type		Feb-04	May-04	Nov-04	May-05	Nov-05	May-06	Total
None	Freq	823	711	776	648	641	452	4,051
	%	44.46	38.39	39.07	33.61	31.24	24.55	
Seat Belt	Freq	860	963	958	974	1007	1020	5,782
	%	46.46	52	48.24	50.52	49.07	55.4	
Booster Seat	Freq	168	178	252	306	404	369	1,677
	%	9.08	9.61	12.69	15,87	19.69	20.04	
Total		1851	1852	1986	1928	2052	1841	11,510

From a baseline in February 2004 to May 2006:

- **Booster seat use increased 11%** (from 9% to 20%)
- **Safety belt use increased 9%** (from 46% to 55%)
- **Non-restraint use decreased 20%** (from 44% to 25%)

Conclusion for Study #1: Survey results demonstrate the multifaceted, school-based educational program, which included a standardized curriculum, consistent messaging and repeated delivery over time, was effective at increasing booster seat and safety belt use, as well as decreasing non-restraint use among 4-8 year olds.

Study Overview #2: Educational Program for Grades 4-8

ThinkFirst For Youth Pilot Study (July 2007)

ThinkFirst National Injury Prevention Foundation

- Based on National Health Education Standards, National Science Standards and the Health Belief Model, ThinkFirst For Youth was developed as two separate curricula, one for grades 4-5 and one for grades 6-8. Different levels of difficulty within each allows for flexibility in teaching youth with different academic abilities and learning methods.
- Curricula include lessons on:
  - Brain and spinal cord anatomy and physiology
  - Vehicular and pedestrian safety
  - Bicycle, sports and water safety
  - Creative problem solving; safety around weapons
  - Choking, suffocation and strangulation hazards
  - Poisons and allergic emergencies
- Each lesson comes with fun, thought-provoking, hands-on activities, messages from "Dr. A" and resources for further information

Methodology

Study Overview #2, cont.

- Pilot testing of the ThinkFirst For Youth program was conducted through 26 ThinkFirst chapters across the United States
- Schools with at-risk populations were determined by the percentage of students receiving subsidized or free meals. On average, each school selected had 70% - 95% of its students receiving subsidized meals.
- The initial lesson on the brain and spinal cord was presented by the chapter educator, after which either the teacher or chapter director implemented subsequent lessons each week. Lessons were 30 minutes long and included worksheets, lectures, reading, basic skill sets (graphing, researching on the internet, etc.) and hands-on activities such as group games.
- A written pretest was given before the six-lesson program (1 lesson per week) and a posttest was given after the program was completed.
- In addition, focus groups of 6-12 students and their teacher were asked 5 questions to elicit their opinions about the curriculum.
- Teachers also completed a 2-page questionnaire about the curriculum.

Results Relating to Safety Belt Use

Study Overview #2, cont.

Knowledge Question:

Cutting the spinal cord causes paralysis

% correct answers before TFFY program **67%**

% correct answers after TFFY program **91%**

Self-reported Behavior Question:

I always wear my seat belt

% yes answers before TFFY program **71%**

% yes answers after TFFY program **99%**

Focus Group: What was your favorite lesson and why?

#1 answer: Learning about the different sections and functions of the brain and spinal cord

Focus Group Question: What was the most important thing you learned?

#1 answer: The importance of wearing m helmet and buckling up

Teacher Questionnaire Comments:

- "Curriculum is an excellent, age-appropriate program"
- "Following state and national standards for health and science, the materials are extremely easy to integrate into either a health or science class."
- "The different levels of difficulty are clearly explained, allowing the teacher the flexibility to teach content to students of all academic level."
- "These activities are key at this cognitive developmental stage for student understanding of the subject. A student's long-term memory is stimulated more by hands-on activities rather than simply reading and writing about a subject."

Study Overview #3: Educational Program for Teens

ThinkFirst For Teens Injury Prevention Program: Evidence-based Practice – Are We Making a Difference?

Gerhardstein, D.B. (Oct. 2007). SCI Nursing, 24.3. www.unitedspinal.org

- Effective educational injury prevention programs include those that convince students to make positive behavior changes to protect themselves and others from injury.
- Changes in behavior depend on individuals perceiving themselves as susceptible to a serious problem, and believing they not only have the ability to change their behavior, but that these behaviors are effective and worth their effort.
- One adjunct program being used in health and driver education classes across the country and in several countries world-wide is ThinkFirst For Teens (TFFT). TFFT is a one hour program that is presented to students by an injury prevention specialist and a person who has sustained a brain or spinal cord injury, known as a VIP speaker, or Voices for Injury Prevention.
- A video of VIP testimonies, a PowerPoint presentation and anatomical brain and spine models are used to explain the causes and ramifications of brain and spinal cord injuries, followed by the personal testimony of someone who has actually been injured and is dealing with a permanent disability.
- The objective is to increase student knowledge as to the high incidence and permanent effects of these injuries, and convince them that it is within their power to make safe choices in order to reduce their risk for these devastating, yet largely preventable injuries.

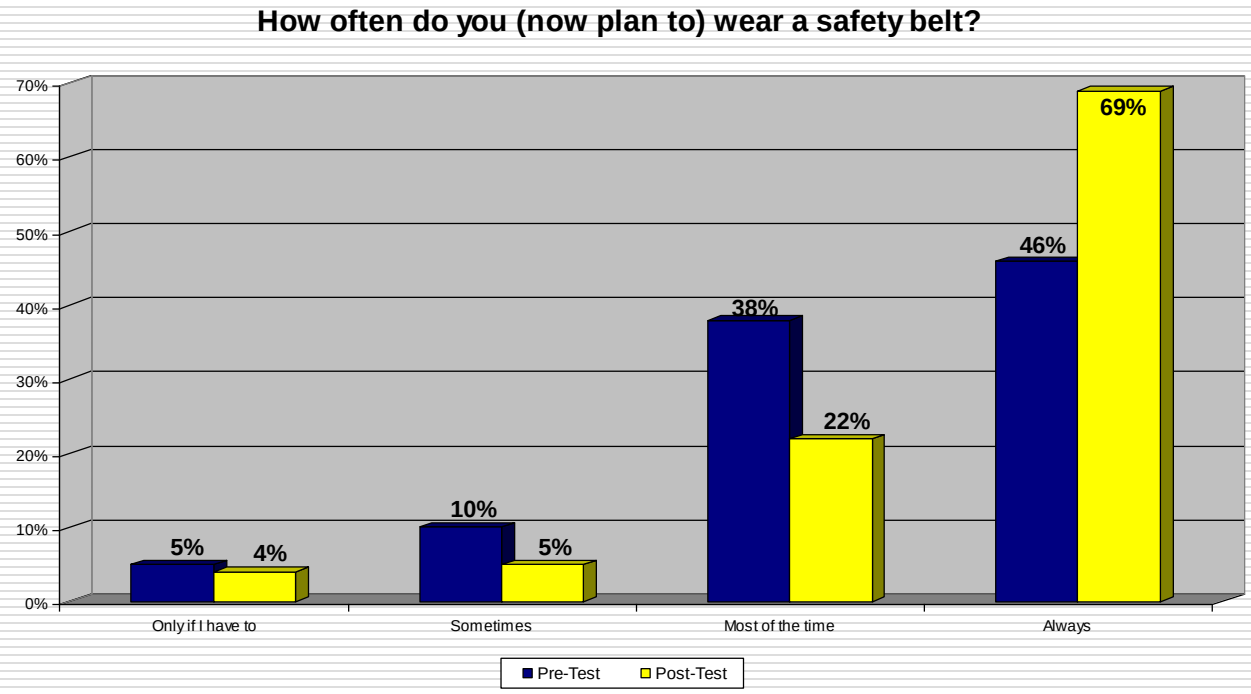
Methodology

Study Overview #3, cont.

- A pretest-posttest design was used to determine the effects on the understanding of potential for injury, and the effects on stated safety behaviors of students participating in ThinkFirst For Teens.
- The study was conducted in three suburban school districts in the Chicago suburbs of Illinois. Data was collected within the classroom setting.
- The test consisted of 20 multiple-choice questions related to their knowledge, attitudes and reported behaviors regarding safety and injury prevention.
- The pretest was administered one day prior to the intervention and the post-test was administered the day following the intervention. Pretests were matched to posttests on a classroom basis.
- A three month posttest survey was conducted in each classroom with questions designed to determine what influencing factors were retained from the intervention. The format required written, narrative answers.

Results, Pertaining to Safety Belt Use

Study Overview #3, cont.

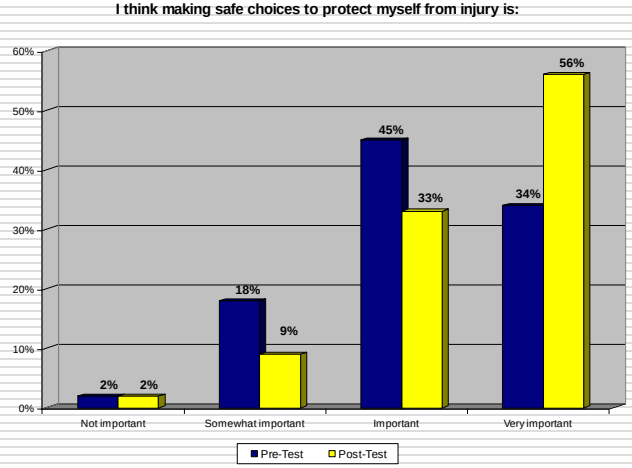


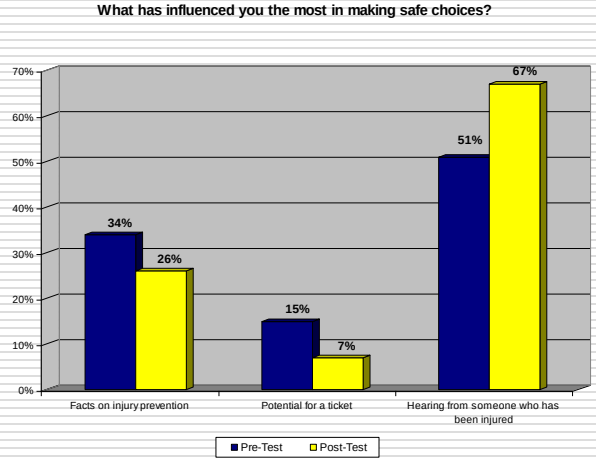
Safety belt use responses showed:

- 20% increase stating it was very important to wear a safety belt in a vehicle (from 53%-73%)
- Pretest showed 46% stating they <u>always</u> wore a safety belt which increased to 69% stating they <u>planned to</u> always wear one, a 22% increase in this stated behavior

Results, Continued

Study Overview #3, cont.





- 22% increase in answering 'making safe choices is very important'
- Students state they are most influenced to make safe choices by hearing from someone who has been injured (67%), followed by facts on injury prevention (26%) or the potential for a ticket (7%)
- 3-month written narrative post-test: 77% stated the program influenced their behavior in some way. Of that 77%:
  - 26% stated they now wear a seatbelt all the time or more often
  - 24% referred to realizing the risk or consequences of their actions
  - 17% referred to the program as reinforcing points they knew they should be following
  - 14% specifically stated they now "make safe choices" or "think first"

For full study, www.thinkfirst.org /efficacy

Conclusions and Implications

- These three studies indicate there is an increase in understanding, stated behaviors and observed behaviors after students learn about their risk for injury and actions for preventing injuries from occurring.
- **Data shows students believe they have the ability to change their behavior, with notable numbers of posttest scores indicating they plan to increase safety belt use, and in general, increase their conviction to consider safety more often.**
- If a one-hour program is capable of impacting teenagers to the degrees indicated, it is conceivable that exposing children, teens and young adults to programs such as these several times throughout their formative years would further instill safety behaviors.
- **Multi-faceted, school-based educational programs which include standardized curriculum, consistent messaging and repeated delivery over time is effective in increasing seat belt use.**
- Schools offer an effective setting for information delivery to improve child passenger safety, affect positive behavior change and obtain measurable outcomes, because schools provide a forum for peer acceptance at all age levels. In addition, schools provide a means of relaying information to parents, who can reinforce safe behaviors if they too are provided with the same educational information.
- **Injury prevention programs offer an essential, cost-effective means of increasing safe behaviors, that will in turn reduce injuries and their associated healthcare and societal costs.**
- Evidence-based educational injury prevention programs should be supported and promoted to assure schools have access to programs and students are able to benefit from exposure to injury prevention education throughout their school years.
- **Injury prevention programs that are incorporated into school health, science and driver education curricula could be one of the most effective means of reducing the leading cause of death and disability to children, teens and young adults.**

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