

Effectiveness of the P.A.R.T.Y. (Prevent Alcohol and Risk-Related Trauma in Youth) Program in Preventing Traumatic Injuries: A 10-Year Analysis

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Background: The P.A.R.T.Y. (Prevent Alcohol and Risk-Related Trauma in Youth) program is a 1-day injury awareness and prevention program for youth aged 15 years and older. The goal is to teach adolescents to recognize their injury risks and make informed decisions to reduce them. This study assessed the effectiveness of the P.A.R.T.Y. Program in preventing traumatic injuries during a period of 10 years (1992–2004).

Methods: P.A.R.T.Y. participants (STUDY) were matched with subjects having the same age, gender, residential area, and initial year in database, who did not attend the P.A.R.T.Y. Program (CONTROL). Data from hospital discharge database, and provincial health claims, were searched to determine the incidence of traumatic injuries in both groups. Statistical comparisons were made for the two groups, gender, calendar year, and before and after the graduating driver licensing system was implemented, using the χ^2 and conditional logistic regression analysis with a $p < 0.05$ considered significant.

Results: Of 3,905 P.A.R.T.Y. participants, 1,281 were successfully randomly matched on the above 4 variables with 1,281 controls. The most frequent injury was injury by other or homicide 373 of 2,562 (14.8%). There were fewer traumatic injuries in the STUDY group than in the CONTROL group (43.3% vs. 47.4%; $p = 0.02$; OR, 1.22; 95% CI, 1.03–1.45). This difference was stronger in females (44.4% vs. 49.0%; $p = 0.04$) and before the graduating driver licensing system implementation (60.1% vs. 67.2%; $p = 0.04$).

Conclusions: The P.A.R.T.Y. Program effectively reduced the incidence of traumatic injuries among its participants. This effectiveness was stronger among females and before the driver licensing system was implemented.

Key Words: P.A.R.T.Y. Program, Prevention, Traumatic injuries, Effectiveness, Youth.

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Injury and violence are major killers of children throughout the world, responsible for ~950,000 deaths in children and young people less than 18 years of age each year.¹ Unintentional injuries account for almost 90% of these cases. They are the leading cause of death for children aged 10 years to 19 years.² The burden of injury falls unequally throughout the world, and although heaviest on the children and youth of poorer countries, Canadian youth and their families are not immune from the devastation caused by injury. Compared with adults, adolescents underestimate risks, making them more vulnerable to major trauma.³

In 2005, a total of 720 Canadians younger than 20 years died as a result of injury.⁴ Furthermore, there were 29,142 injury hospitalizations for this age group in the year spanning 2005 to 2006. Injuries were the third leading cause of hospitalizations among all children and youth, behind respiratory and digestive disease.⁵ Motor vehicle crashes accounted for the majority (60%) of these injuries. But the most striking data are that for every adolescent who dies from trauma, >10 have severe injuries, requiring one or more surgeries in addition to lengthy hospital stay and rehabilitation.⁶ Equally striking is the fact that young males are disproportionately over represented in injury death statistics compared with their female counterparts in so much as a ratio of 3:1.

The Program

The P.A.R.T.Y. (Prevent Alcohol and Risk-Related Trauma in Youth) Program is a 1-day in-hospital injury awareness and prevention program for youth aged 15 years and older, developed in 1986 in Toronto, Ontario, at Canada's first and largest trauma center, Sunnybrook Health Sciences Centre. This program is a vital component of the growing community effort to reduce traumatic intentional and unintentional injury and death in youth, resulting from alcohol, drug, and risk-related crashes and incidents. The goal of the P.A.R.T.Y. Program is to provide young people with information about trauma that will enable them to recognize potential injury-producing situations, make prevention-oriented choices, and adopt behaviors that minimize unnecessary risk.

At Sunnybrook Health Sciences Centre, twice weekly during the school year, the P.A.R.T.Y. Program is offered to groups of 35 to 40 students, accompanied by a teacher or adult leader. The P.A.R.T.Y. Program does not mandate who will attend the program; rather, teachers or schools from the

Greater Toronto Area and the municipalities that comprise southern Ontario's "Golden Horseshoe" may choose the students who attend, may bring an entire class or open the opportunity up to the student body to self-select. In some instances, the P.A.R.T.Y. Program has worked directly with probation centers and alternative schools to provide opportunities to "at-risk" youth to attend P.A.R.T.Y. Program. Students follow the course of injury from occurrence through transport, treatment, rehabilitation, and community reintegration. They interact with a team of health care professionals and members of the emergency medical system that includes a paramedic, a police officer, nurses, a physician, and a social worker. The students are given information about the following: basic anatomy and physiology; the mechanics of injury; the effect that alcohol and drugs have on decision making; risk assessment; concentration and coordination; the nature of injuries that can be repaired and those that cannot; and the effect of injury on families, finances, and future plans.

Participants begin to see the role their choices play in affecting their independence or risk of injury. The facilitator helps students to understand that risk is a part of everyday life and it is how they manage risk through the choices they make that can determine their continued independence or injury. The facilitator continues to emphasize that each lived experience combined with education or training that ultimately prepares them to make informed choices before they proceed to a decision. In delivering this message, the facilitator makes the strong recommendation that students take an extra 30 seconds before making a critical decision.

Encouraging students to take an extra 30 seconds to consider their options is vital because their brain development is not yet at a point of full maturation. The human brain develops in stages. The part of the brain (prefrontal cortex) that controls emotions is responsible for impulse control, judgment, decision making, planning, and organization and does not reach full maturity until around the age of 25 years.⁷

As students progress through the program, they are introduced to various elements of injury management and stages of recovery. The P.A.R.T.Y. Program team includes people who have been injured; some are still in acute care, some others in rehabilitation, and some have returned home. The injury survivors provide a personal perspective on injury, going through rehabilitation and treatment, and the challenge of living with injury—in a sense "putting one's life back on track." The P.A.R.T.Y. Program intends to influence the behavior of youth by creating a vivid clinical reality of injury that is processed and stored cognitively and emotionally by the participants.

The program concludes with a challenge to the participants to become individually and collectively committed to promoting behaviors and activities that minimize the risk of injury. Students are presented with a "Contract for Life," which is signed between people who care about each other such as a teenager and a parent, guardian, or trusted adult. Finally, students are provided with a list of activities, which they can do after the program to encourage an ongoing dialogue within their family, school, or community (Table 1).

TABLE 1. Sample of Follow-Up Activities for Students After P.A.R.T.Y. Program Attendance

1. Create a commercial to express your concern about head and spinal cord injuries and share it with your local cable company.
2. Write and produce a play in which a character sustains and lives with a head and/or spinal cord injury. Video tape your play and share it with other schools.
3. Write a letter to the provincial and federal ministers of health declaring your intention as a group to do something about death and injury because of risk behaviors.
4. Watch a television show or commercial and list the risk activities and the outcome portrayed.
5. Rent a wheelchair for a week and experience the reality of access and independence.
6. Invite a speaker from the Head Injury Association (or similar) to speak in your school.

Students complete hand-written evaluations not more than 1-week after participation in which they provide their comments on the experience of the P.A.R.T.Y. Program. The sample of comments provided by students is given in Table 2.

Study Objective

The objective of this 10-year longitudinal study (1993–2002) was to determine whether students who attended the P.A.R.T.Y. Program had a reduction in injuries when compared with a match-control group of students based on age, gender, and geographic area who did not attend the program.

METHODS

After approval by the Research Ethics Board of the Sunnybrook Health Sciences Centre, a retrospective review of electronic data from the Ontario hospital discharge database (Canadian Institute of Health Information) and the provincial health claims (Ontario Health Insurance Plan) was

TABLE 2. Sample of Student Comments After P.A.R.T.Y. Program Attendance

- We slammed head on with the reality of our choices, and we get to walk away into our future, others may not be so lucky.
- Seat belts and some common sense can save your life.
- It was a very influential experience mainly because we were talking face to face with people that were once just like us.
- It is a good experience that really shows teens that they are not invincible and anything could happen to them too.
- This was the greatest experience for me because no other lecture or activity has ever hit me as hard as this program did.
- The experience made me feel lucky to have all of the abilities that I do have (full use of my limbs, walking, etc).
- Reality is something that most of us should see but don't, I'm glad that I got to see it before I did something stupid to myself or someone else.
- I learned stuff that I thought I already knew, but after P.A.R.T.Y. Program for 1 day, I felt that I knew more because I saw the impacts.
- The P.A.R.T.Y. Program is not a game or a movie or shouldn't be taken as a joke; it is real people and real-life situations.
- Speaking and hearing the stories of those whose life has changed because of their crash . . . really helped me to understand.

performed to determine the incidence of traumatic injuries in adolescents (age, 15–19 years) between 1992 and 2004.

P.A.R.T.Y. Program participants (STUDY) were matched with a group of subjects having the same age, gender, residential area (postal code first 3 digits), and initial year in database, who did not attend the P.A.R.T.Y. Program (CONTROL). Statistical comparisons were made for the two groups by gender, calendar year, and before and after the graduated driver licensing system was implemented in Ontario (April 1, 1994), using the χ^2 and conditional logistic regression analysis with a $p < 0.05$ considered significant.

RESULTS

Of the 3,905 P.A.R.T.Y. Program participants, there were 1,281 pairs successfully randomly matched on the above 4 variables with 1,281 controls. Of these pairs, there were 317 pairs in which both members of the pair had an event (trauma) and 436 pairs where both members of the pair did not have an event. The remaining 528 pairs were the ones in which a member of one group had an event and the other did not.

Incidence of Traumatic Injuries

There were fewer traumatic injuries in the STUDY group than in the CONTROL group (43.3% vs. 47.4%; $p = 0.02$; OR, 1.218; 95% CI, 1.027–1.446). This result indicates that those in the CONTROL group were at a 21.8% greater risk of a traumatic event than those in the STUDY group.

Time to First Traumatic Injury

The average time to first event was measured from the time of attending the P.A.R.T.Y. Program to the time of an injury event. In the STUDY group, the average time to first event was 898 days \pm 811 days compared with a CONTROL group average time to first event of 436 days \pm 727 days. This result was statistically significant ($p < 0.0001$) and indicated that participants within the STUDY group who had an event had it at a later date (462 days \pm 84 days) than their matched CONTROLS (Fig. 1).

Traumatic Injury by Gender

Of the 1,580 females in the study (790 pairs), there were more traumatic injuries in the CONTROL group ($n = 387$, 49%) than in the STUDY group ($n = 351$, 44.4%), and this difference was statistically significant ($p = 0.04$). Of the 982 males in the study (491 pairs), there were more traumatic injuries in the CONTROL group ($n = 220$, 44.8%) than in the STUDY group ($n = 204$, 41.6%), and this difference was statistically significant ($p = 0.04$). Females had a greater reduction in traumatic injuries compared with males (36 vs. 16, $p = 0.04$).

- P.A.R.T.Y. = 29.9 \pm 27.0 months
- Control = 14.5 \pm 24.2 months
- $P < 0.0001$

Figure 1. Time to first traumatic injury.

Traumatic Injury Diagnosis

The STUDY group experienced injuries of less severity than the CONTROL group, and this difference was statistically significant ($p = 0.001$). Injuries of the back, burns, respiratory distress, and intercranial occurred with higher frequency in the CONTROL group than the STUDY group (CONTROL group = back [590 of 7644, 7.72%], burns [168 of 7644, 2.20%], respiratory distress [769 of 7644, 10.06%], and intercranial [488 of 7644, 6.38%]; STUDY group = back [0 of 8217, 0%], burns [121 of 8217, 1.47%], respiratory distress [0 of 8217, 0%], and intercranial [238 of 8217, 2.90%]). In the categories of injury where the STUDY group rated higher than the CONTROL group, the injury diagnosis was less severe (wound, fractures, synovium/tendon/bursa, and dislocation).

DISCUSSION

This study shows that P.A.R.T.Y. Program participants had lower incidence of traumatic injuries than a control group of non-P.A.R.T.Y. Program participants of the same age, gender, residential area, and initial year in database, during the 10-year study. The P.A.R.T.Y. Program reduced the incidence of traumatic injuries in general, but the reduction was significantly greater among females ($n = 36$, 4.9%) than in males ($n = 16$, 3.8%). These findings are consistent with Economic Burden of Injury in Canada (2009) data that demonstrate a higher rate of injury for males aged 15 years to 19 years compared with their female counterparts in the injury categories of transport (42%), suicide (40%), violence (33%), and falls (18%).

This study shows the effectiveness of the P.A.R.T.Y. Program in reducing the incidence of traumatic injuries. This study also confirms the increased modification of the risk behavior of its participants, in this case, P.A.R.T.Y. Program and non-P.A.R.T.Y. Program participants.

There were no deaths among youth caused by traumatic injury in this study. The P.A.R.T.Y. Program did not reduce all traumatic injuries but helped its participants to remain free from injury longer than the CONTROL group (898 days vs. 436 days, $p < 0.0001$). This represents a change in behavior among those participating in the P.A.R.T.Y. Program. Furthermore, the injury severity to those P.A.R.T.Y. Program participants was significantly lower than the CONTROL group. It will be necessary to review the curriculum of the P.A.R.T.Y. Program annually in concert with an external scan of youth injury trends and other inputs to determine and implement modifications.

Limitations

The limitations of this study are related to the retrospective use of two different electronic databases to obtain the data used for comparison between the two subject groups. The hospital discharge database has data related to the demographic characteristics, diagnoses, complications, and outcomes of patients discharged from hospitals. The provincial health claims has the demographic characteristics and the reason for claims submitted by physicians because of the diagnostic or therapeutic procedures provided to people cov-

ered by the provincial health insurance system. Other limitation of this study was the change, during the 10-year period of this study, in the coding system version (International Classification of Diseases-ninth revision [ICD-9] to ICD-10) used for diagnosis of injuries and therapeutic activities performed by the treating physician. Despite having equivalent codes between ICD-9 and ICD-10, the version code change made it difficult to categorize the main diagnosis of the traumatic injury.

CONCLUSION

In conclusion, this study demonstrates the effectiveness of a hospital-based program in reducing traumatic injuries. The P.A.R.T.Y. Program effectively reduced the incidence of traumatic injuries among its youth participants. This effectiveness was stronger among females than males. Finally, vivid clinical reality, as an alternate method of education, may be more compelling than standard classroom education; however, further study or investigation is recommended.

REFERENCES

1. World Health Organization. *The Global Burden of Disease: 2004 Update*. Geneva, Switzerland: World Health Organization; 2008.
2. Peden M, Oyegbite K, Ozanne-Smith J, et al., eds. *World Report on Child Injury Prevention*. Geneva, Switzerland: World Health Organization; 2008.
3. MacDonald N, Yanchar N, Hébert PC. What's killing and maiming Canada's youth? *CMAJ*. 2007;176:737.
4. Public Health Agency of Canada. *Injury and Child Maltreatment Section Analysis of Statistics Canada Mortality Data*. Ottawa, Ontario, Canada: Public Health Agency of Canada; 2009.
5. Public Health Agency of Canada. *Injury and Child Maltreatment Section Analysis of Canadian Institute for Health Information Hospitalization Data*. Ottawa, Ontario, Canada: Public Health Agency of Canada; 2009.
6. Statistics Canada. Causes of death, 2003. Cat. No. 84-208-XIE. Available at: www.statcan.ca/bsolc/english/bsolc?catno=84-208-X. Accessed March 7, 2009.
7. Park A. Inside the adolescent brain. *Time Magazine*. May 10, 2004.

EDITORIAL COMMENT

Over the past 100 years, we have made huge strides in trauma care. We have improved our prehospital care, emergency room care, operative management, and intensive care unit care. Mortality and morbidity from trauma and burns have dropped significantly over the past 50 years to 60 years. We have had our greatest impact on survival in the prevention arena. Industrial disasters are relatively rare because of work place safety. Patients not only survive previously fatal automobile crashes but some patients also come out of the ordeal without a scratch because of seat belts, safety glass, air bags, and crumple zones.¹

The current article² digs into this rich history of prevention. The authors ask the question how can we reduce teenage morbidity and mortality? The Canadian P.A.R.T.Y. (Prevent Alcohol and Risk-Related Trauma in Youth) program is patterned after the ThinkFirst!³ program here in the

United States. It is clear that teenagers die and are injured for many preventable reasons.

Sunnybrook Health Sciences Centre offered P.A.R.T.Y. twice weekly where students can voluntarily sign up and take part in this program. Simply put this program encourages students "to take an extra 30 seconds" to think. Almost 4,000 students were enrolled in this program over a 12-year period. Students who participated in this program were compared with a control group. The control group had significantly more injuries and those injuries were more severe than those in the study group.

As with all good articles, this article raises as many questions as it answers. Although P.A.R.T.Y. decreases traumatic injuries, in the study group, did it decrease alcohol consumption? If it did decrease alcohol consumption, did it decrease the usage of other drugs like marijuana and cocaine? How long does the effect last? One of the biggest problems with several of the teenage trauma prevention programs that were developed in the 1970s (like Scared Straight⁴) was that the modified behavior only lasted a relatively short time. Somehow, we need programs that will help teenagers throughout all of their at-risk years (age, 15–25 years). Does the program need to be repeated every 12 months to 18 months? Would another program, P.A.R.T.Y. II, if you will, be more effective than simply repeating P.A.R.T.Y.?

I commend the authors on this article. I look forward to more work from this Canadian group. Here in the United States, trauma prevention seems to be fragmented. There are several trauma centers, national groups and even regional groups, who are trying to tackle the problem of teenage injuries. There seems to be no momentum toward a single program or national standard. One of the reasons for this national stagnation is a lack of funding. Federal, state, and local funding is inadequate. Moreover, many trauma surgeons are overwhelmed with their clinical responsibilities and have little or no time for outreach programs. More funding will help us hire additional trauma surgeons, trauma nurses, and other interested professionals so that we can institute programs such as P.A.R.T.Y. and ThinkFirst! in our own institutions.

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REFERENCES

1. MacKenzie EJ, Fowler CJ. Epidemiology. In: Feliciano DV, Mattox KL, Moore EE, eds. *Trauma*. New York, NY: McGraw Hill; 2008;28–37.
2. Banfield JM, Gomez M, Kiss A, Redelmeier DA, Brennen F. Effectiveness of the Prevent Alcohol and Risk-Related Trauma in Youth program in preventing traumatic injuries: a 10-year analysis. *J Trauma*. 2011;70:732–735.
3. Eyster EF, Watts C. Available at: www.thinkfirst.org. Accessed December 10, 2010.
4. Petrosino A, Turpin-Petrosino C, Buehler J. "Scared Straight" and other juvenile awareness programs for preventing juvenile delinquency. *Cochrane Database Syst Rev*. 2002;2:CD002796.