Injury Prevention Practices as Depicted in G-Rated and PG-Rated Movies

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**Background:** Previous studies on alcohol, tobacco, and violence suggest that children's behavior can be influenced by mass media; however, little is known about the effect of media on unintentional injuries, the leading cause of death among young persons in the United States.

**Objective:** To determine how injury prevention practices are depicted in G-rated (general audience) and PG-rated (parental guidance recommended) movies.

**Design:** Observational study.

**Setting:** The 25 movies with the highest domestic box-office grosses and a rating of G or PG for each year from 1995 through 1997. Movies that were predominantly animated or not set in the present day were excluded from analysis.

**Subjects:** Movie characters with speaking roles.

**Main Outcome Measures:** Safety belt use by motor vehicle occupants, use of a crosswalk and looking both ways by pedestrians crossing a street, helmet use by bicyclists, personal flotation device use by boaters, and selected other injury prevention practices.

**Results:** Fifty nonanimated movies set in the present day were included in the study. A total of 753 person-scenes involving riding in a motor vehicle, crossing the street, bicycling, and boating were shown (median, 13.5 person-scenes per movie). Forty-two person-scenes (6%) involved falls or crashes, which resulted in 4 injuries and 2 deaths. Overall, 119 (27%) of 447 motor vehicle occupants wore safety belts, 20 (18%) of 109 pedestrians looked both ways before crossing the street and 25 (16%) of 160 used a crosswalk, 4 (6%) of 64 bicyclists wore helmets, and 14 (17%) of 82 boaters wore personal flotation devices.

**Conclusions:** In scenes depicting everyday life in popular movies likely to be seen by children, characters were infrequently portrayed practicing recommended safe behaviors. The consequences of unsafe behaviors were rarely shown. The entertainment industry should improve its depiction of injury prevention practices in G-rated and PG-rated movies.

**Arch Pediatr Adolesc Med. 2000;154:283-286**

**Editor’s Note:** It’s pretty sad when you can’t act appropriately even when you’re acting.  

*Catherine D. DeAngelis, MD*

**UNINTENTIONAL INJURIES** are the leading cause of death in the United States for persons aged 1 to 34 years. Efforts to prevent injuries often require behavior changes (eg, wearing a helmet while bicycling and using a safety belt when in a motor vehicle); however, changing behavior patterns is not easy.

Many factors influence a person’s behavior, one of which is the media. The typical child in the United States is exposed to an average of more than 3 hours of mass media per day (ie, a combination of television, movies, radio, and other sources). Previous studies of tobacco use, alcohol consumption, and violence in movies and television strongly suggest that children’s behavior can be influenced by media images.

To examine the role movies might play in influencing children’s injury prevention practices, we studied how often certain activities (eg, riding in a motor vehicle, crossing a street as a pedestrian, bicycling, and boating) were shown in movies likely to be seen by children and determined how injury prevention practices for these activities were depicted.

**RESULTS**

Of the 75 movies in the initial sample, 25 (33%) were excluded; 9 (12%) were animated, and 16 (21%) were not set in the present day. The final sample consisted of 50 films (14 movies from 1995, 17 from 1996, and 19 from 1997). Four (8%) of the movies were rated G and 46 (92%) were
MATERIALS AND METHODS

We selected the 25 G-rated (general audience) or PG-rated (parental guidance recommended) movies with the highest domestic box-office grosses for each year from 1993 through 1997 as reported in Variety.²¹²² Movies that were predominantly animated or not set in the present day were excluded from data collection. Animated movies were excluded because we wanted to restrict the study to movies that depicted reality. Movies that were not set in the present were excluded because injury prevention recommendations have changed over time.

A scene was defined as a portion of the movie in which the narrative and action formed a coherent whole. A person-scene was defined as 1 person involved in an activity of interest in 1 scene. For example, 4 persons riding bicycles in 1 scene would constitute 4 person-scenes. Movies were categorized as comedies, family films, or others, based on the classification system of a national video store chain.

At least 2 of the 6 coauthors viewed each film in videocassette format using a standard data collection form that contained sections on activities of interest as well as the age and sex of the movie characters engaged in these activities. A character’s age was categorized into 1 of 4 age groups (0-4, 5-13, 14-17, or ≥18 years) based on physical appearance, school attendance, and other distinguishing factors shown in the movie. Coauthors compared their results and reconciled any differences.

Injury prevention practices were based on recommendations of national organizations (eg, American Academy of Pediatrics and Centers for Disease Control and Prevention).¹³⁻²⁰ For motor vehicle occupants, we examined safety belt use; for pedestrians crossing a street, we assessed if persons used a crosswalk and if they looked both ways before entering the street; and for recreational boaters, we checked for use of personal flotation devices (PFDs). For bicycling, in-line skating, riding a motorcycle, horseback riding, skateboarding, and snowmobiling, we recorded helmet use. For in-line skating and skateboarding, we also recorded the use of elbow pads, wrist guards, and knee pads.

For movies in the final sample, activities of fantasy characters (eg, aliens, angels, ghosts, and miniature people) and scenes of fantasy settings (eg, piloted space flight to Mars and flying cars) were excluded from data collection. Scenes involving events not set in the present day were also excluded. Information was recorded only for characters that had speaking roles in the movies because (1) the behavior of characters with speaking roles likely had a greater effect on the viewing audience and (2) it would have been difficult, if not impossible, to record the behavior of all characters in some scenes (eg, a shot of hundreds of pedestrians on a busy New York City street). Injury prevention practices were not recorded during life-threatening scenes. For example, when a gunman abducted 2 persons and forced them onto a boat, use of PFDs was not recorded. Information also was not recorded in certain circumstances if doing so appeared unreasonable based on common practices in the United States (eg, safety belt use on a bus or PFD use on a large, commercial boat). Data were entered and analyzed using Epi Info version 6 software.²² Relative risks (RRs) and 95% confidence intervals (CIs) were calculated using SUDAAN Survey Data Analysis Software²³ to control for clustering of behaviors within scenes and scenes within movies.

Rated PG. Twenty-five movies (50%) were comedies, 20 (40%) were family films, 3 (6%) were dramas, 1 (2%) was an action/adventure movie, and 1 (2%) was a documentary. The median domestic box-office gross was $31 million (range, $10 to $136 million).

A total of 753 person-scenes involved characters with speaking roles riding in a motor vehicle, crossing the street, bicycling, or boating, for a median of 13.5 person-scenes per movie (range, 0-40). This total included 42 person-scenes involving crashes or falls that resulted in 4 injuries. Two of the 4 persons who were injured made immediate recoveries. There were also 2 deaths from motor vehicle crashes depicted in the movies; both involved female adults, one of whom was later resurrected as a ghost. Only 1 scene in 1 movie involving the injury of a young girl and the death of her mother in a rectored as a ghost. Only 1 scene in 1 movie involving the activities of interest as well as the age and sex of the movie characters engaged in these activities. A character’s age was categorized into 1 of 4 age groups (0-4, 5-13, 14-17, or ≥18 years) based on physical appearance, school attendance, and other distinguishing factors shown in the movie. Coauthors compared their results and reconciled any differences.

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Thirty-two (64%) of the 50 movies showed pedestrians crossing a street, with a median of 4 person-scenes per movie with this activity (range, 1-19). Sixteen percent of pedestrians used crosswalks, including 15 (15%) of 102 adults and 10 (17%) of 58 children. Sixteen (29%) of 55 females used crosswalks, compared with 9 (9%) of 105 males (RR, 3.4; 95% CI, 1.5-7.6). Fifty-one (32%) of 160 pedestrians were shown in the street at the start of the scene. For the remaining 109 (68%) pedestrians, 18% looked both ways before entering the street, including 14 (21%) of 67 adults and 6 (14%) of 42 children (RR, 1.5; 95% CI, 0.6-3.4). Nine (24%) of 37 females looked both ways before entering the street, compared with 11 (13%) of 72 males (RR, 1.6; 95% CI, 0.8-3.4). Forty-one (26%) of 160 pedestrians either used a crosswalk or looked both ways; 4 (4%) of 109 did both.

Fifteen (30%) of the 50 movies showed bicycling, with a median of 4 person-scenes per movie with this activity (range, 1-14). Six percent of bicyclists wore helmets, including 1 (6%) of 16 adults and 3 (6%) of 48 children. None of 14 females wore helmets, compared with 4 (8%) of 50 males.

Ten (20%) of the 50 movies showed boating, with a median of 6.5 person-scenes per movie with this activity (range, 1-31). Seventeen percent of characters wore PFDs, including 10 (18%) of 57 adults and 4 (16%) of

<table>
<thead>
<tr>
<th>Activity</th>
<th>No. (%) of Movies With Activity</th>
<th>Safe Practices With Safe Practices/Person-Scenes With Activity (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Riding in motor vehicle</td>
<td>45 (90)</td>
<td>Safety belts or child safety seat 119/447 (27)</td>
</tr>
<tr>
<td>Crossing street as a pedestrian</td>
<td>32 (64)</td>
<td>Using a crosswalk 25/160 (16)</td>
</tr>
<tr>
<td>Bicycling</td>
<td>15 (30)</td>
<td>Helmet 4/64 (6)</td>
</tr>
<tr>
<td>Boating</td>
<td>10 (20)</td>
<td>Personal floatation device 14/82 (17)</td>
</tr>
<tr>
<td>In-line skating</td>
<td>8 (16)</td>
<td>Helmet 28/42 (67)</td>
</tr>
<tr>
<td>Horseback riding</td>
<td>3 (6)</td>
<td>Helmet 2/7 (29)</td>
</tr>
<tr>
<td>Motorcycle riding</td>
<td>3 (6)</td>
<td>Helmet 3/5 (60)</td>
</tr>
<tr>
<td>Skateboarding</td>
<td>3 (6)</td>
<td>Helmet 0/3 (0)</td>
</tr>
<tr>
<td>Snowmobiling</td>
<td>1 (2)</td>
<td>Helmet 1/7 (14)</td>
</tr>
</tbody>
</table>

Our results indicate that in scenes depicting everyday life in popular movies likely to be seen by children, characters are infrequently portrayed practicing recommended safe behaviors. There were no significant differences in injury prevention practices between adults and children. Females tended to use appropriate injury prevention practices more often than males. Use of safety belts and bicycle helmets in movies was lower than both current practice in this country (recent surveys indicate that 68% of motor vehicle occupants are properly restrained and 18% of adult bicyclists and 25% of child bicyclists wear helmets) and year 2000 objectives (≥85% use of occupant protection systems and ≥50% use of bicycle helmets). Movies also rarely depicted the consequences of behaviors. Characters were infrequently injured even when engaging in high-risk activities, and those who were injured often made instant recoveries. Most images that a child sees in G- and PG-rated movies do not promote appropriate injury prevention practices.

Although multiple factors influence a child's behavior, both the amount and type of exposure to mass media can affect risk taking. For example, in the 1970s, young bicyclists were injured attempting to imitate stunts performed on television by Evel Knievel. Although the exact role of media images on injury prevention practices by children can be debated, changing behaviors by characters in movies could be an inexpensive, minimally intrusive method of modeling appropriate behaviors to a large audience.

Attempts to influence media portrayals of injury prevention practices have met with some success. After a letter advocating safety belt use was sent to 8 cartoonists who used vehicle occupants in their comic strips, safety belt use increased from 15% to 41% in these comic strips. Safety belt use by at least 1 star of a television action show increased after a letter-writing campaign by students. However, the overall improvement in safety belt use by television characters in the past 2 decades has been disappointing.

This study has at least 3 limitations. First, the study period was too short to assess trends in injury prevention practices in the movies over time. Second, although we did not collect data for nonspeaking characters, it appeared that their injury prevention practices were usually the same or worse than those of characters with speaking roles. Because many person-scenes included nonspeaking characters, our results likely underestimate the number of person-scenes that a viewer is actually exposed to and overestimate the percentage of scenes that depict appropriate behavior. Finally, whether we can generalize our results from movies to television is unknown, which is important because television is the dominant medium to which children are exposed. Two previous studies suggest, however, that injury prevention practices may be similar in movies and television.

Greenberg and Thanki found that 19% of characters wore PFDs, compared with 5 (9%) of 55 males (RR, 3.7; 95% CI, 1.9-7.0). There were 64 additional person-scenes involving other recreational activities of interest. No other activity occurred in more than 8 movies (16%) in the study sample. Helmets were used in 28 (67%) of 42 person-scenes involving in-line skating, 3 (60%) of 5 person-scenes involving riding a motorcycle, 2 (29%) of 7 person-scenes involving horseback riding, 1 (14%) of 7 person-scenes involving snowmobiling, and none of 3 person-scenes involving skateboarding. Thirty-one (74%) of 42 in-line skaters wore wrist guards, 30 (71%) wore elbow pads, and 30 (71%) wore knee pads. None of the 3 skateboarders wore any protective equipment. The results for in-line skating were affected by good compliance with safety recommendations in 3 films that had a substantial number of person-scenes of this activity. For example, helmets were used in 26 (96%) of 27 person-scenes in these 3 movies, but in just 2 (13%) of 15 person-scenes in the other 5 movies with scenes of in-line skating.
safety belts in a study of 1996 movies from all rating categories. In a similar study of broadcast and cable television that Greenberg and Gregg conducted in 1997, safety belts were found to be used by 21% of the characters.

Based on our findings, we make 3 recommendations. First, we encourage the entertainment industry to depict appropriate injury prevention behaviors in children's movies. The Entertainment Industries Council (Burbank, Calif) had a safety belt initiative in the 1980s; this program should be revived and expanded to include other areas of injury prevention (eg, pedestrian behavior, bicycling, and boating). Second, parents should be educated about injury prevention so that they can help their children recognize inappropriate behaviors that are depicted in movies or other mass media. Parents also need to be aware of the importance of being good role models for their children with regard to injury prevention practices. Although media images are powerful, they are probably less important than the behavior patterns set by a child's parents. Finally, surveillance of injury prevention practices in children's movies should be maintained to assess trends over time.

Accepted for publication August 16, 1999.

We thank Larry Deutchman, Suzanne Gates, MPH; Bradley Greenberg, PhD; Todd Heatherton, PhD; Lori Hutwagner, MS; Marcie-jo Kresnow, MS; Ron Moolenaar, MD; Alice Pelletier; Thomas Torok, MD; and Larissa Wilberschied, MS, for their assistance.

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