

Injury-Prevention Practices as Depicted in G- and PG-Rated Movies, 2003–2007



WHAT'S KNOWN ON THIS SUBJECT: Unintentional injuries are the leading cause of death among children in the United States. Children often imitate what they see depicted in films. Two previous studies found that appropriate injury-prevention practices were infrequently portrayed in movies marketed for children.



WHAT THIS STUDY ADDS: Depictions of injury-prevention practices in G- and PG-rated movies have improved for safety belt usage in motor vehicles, pedestrians using crosswalks, boaters using PFDs, and bicyclists wearing helmets. However, there remains considerable room for further progress by the entertainment industry.

abstract

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OBJECTIVE: Our goal was to determine if the depiction of injury-prevention practices in children's movies is different from what was reported from 2 earlier studies, which showed infrequent depiction of characters practicing recommended safety behaviors.

METHODS: The top-grossing 25 domestic G-rated (general audience) and PG-rated (parental guidance suggested) movies per year for 2003–2007 were included in this study. Movies or scenes were excluded if they were animated, not set in the present day, fantasy, documentary, or not in English. Injury-prevention practices involving motor vehicles, pedestrians, boaters, and bicyclists were recorded for characters with speaking roles.

RESULTS: Sixty-seven (54%) of 125 movies met the inclusion criteria for this study. A total of 958 person-scenes were examined: 524 (55%) depicted children and 434 (45%) adults. Twenty-two person-scenes involved crashes or falls, resulting in 3 injuries and no deaths. Overall, 311 (56%) of 555 motor-vehicle passengers were belted; 73 (35%) of 211 pedestrians used crosswalks; 60 (75%) of 80 boaters wore personal flotation devices; and 8 (25%) of 32 bicyclists wore helmets. In comparison with previous studies, usage of safety belts, crosswalks, personal flotation devices, and bicycle helmets increased significantly.

CONCLUSIONS: The entertainment industry has improved the depiction of selected safety practices in G- and PG-rated movies. However, approximately one half of scenes still depict unsafe practices, and the consequences of these behaviors are rarely shown. The industry should continue to improve how it depicts safety practices in children's movies. Parents should highlight the depiction of unsafe behaviors and educate children in following safe practices. *Pediatrics* 2010;125:290–294

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KEY WORDS

movie, children, injury

ABBREVIATIONS

PFD—personal flotation device

ATV—all-terrain vehicle

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Unintentional injuries are the leading cause of death among children in the United States, accounting for 36% of deaths among children aged 1 to 14 years in 2005.¹ Unintentional injuries can be substantially reduced by following safety recommendations (eg, correct use of safety belts in a motor vehicle, use of personal flotation devices [PFDs] in boats, and use of helmets when bicycling). Children often imitate what they see on television and in films, and access to movies at home has increased with Internet, DVD, and cable television availability. The average child is estimated to have spent the equivalent of >2 years of life watching mass media by the age of 18 years.^{2,3} The authors of studies have demonstrated that children's behavior toward alcohol, tobacco, violence, and injury prevention can be influenced by mass media.^{4–9} The social cognitive theory suggests that children often imitate behavior seen in mass media.¹⁰ The authors of previous studies examining G- and PG-rated movies reported that movies infrequently depicted characters following nationally recommended safety practices.^{11,12} We investigated how injury-prevention practices were shown in G- and PG-rated movies during 2003–2007 to determine if the depiction of practices in children's movies has changed.

METHODS

This study used the original protocol from the 1995–1997 study with modifications implemented from the 1998–2002 study, which included using DVD format, coding by 2 pairs of reviewers, and the exclusion of documentaries.

Sample

For 2003–2007, we identified the 25 G-rated or PG-rated movies with the top-grossing annual domestic box office sales, for a total sample size of 125 movies.^{13–17} On the basis of categories of a national mail-order video com-

pany, movies were categorized as action/adventure films, children/family films, comedies, and dramas. Movies that were animated, not set in the present day, documentary, or not in English were excluded. We excluded fantasy characters (eg, elves or Santa Claus). Scenes not set in the present day were excluded because injury-prevention recommendations have changed with time. Scenes depicting fantasy settings (eg, flying cars) or in which safety practices are uncommon in the United States (eg, safety belt use on a bus or PFD use on a commercial boat) were excluded as well.

Unit of Analysis

Scenes were defined as a portion of the movie where the narrative and action provided a coherent picture with a discrete beginning and end (eg, a family in a motor vehicle driving to soccer practice). A person-scene was defined as a scene where 1 person was involved in an activity of interest. For example, a person riding in a motor vehicle would be counted as 1 person-scene. Three people riding in a motor vehicle would be counted as 3 person-scenes.

Variables Coded

Injury-prevention practices were coded on the basis of recommendations from national organizations (eg, the Centers for Disease Control and Prevention or the American Academy of Pediatrics).^{18–23} For motor vehicles, we observed safety belt or child safety seat use of occupants. For pedestrians, we observed use of crosswalks and looking both ways before entering the street. For boaters, we observed use of PFDs. For bicycles, motorcycles, rollerblades, skateboards, all-terrain vehicles (ATVs), snowmobiles, and horseback riders, we assessed helmet use. For skateboarding and rollerblading, we also observed use of elbow pads, knee pads, and wrist guards.

Coding

Coding was conducted only for characters with speaking roles, which was defined as having at least 2 lines of dialogue throughout the movie. This was done for 2 reasons. First, characters with speaking roles were more likely to have an effect on the viewing audience than characters with nonspeaking roles. Second, coding injury-prevention behaviors of all characters in certain scenes would not have been possible (eg, hundreds of pedestrians crossing a street in New York City). Data were collected on age and gender. Characters were determined to be children or adults on the basis of physical appearance, school attendance, job, and other distinguishing factors. In accordance with the first 2 studies, characters in scenes where safety belt usage was not clearly visible were treated as unbelted.^{11,12} Scenes with pedestrians already in a street were coded only for use of a crosswalk because we were unable to determine if the pedestrian looked both ways before entering the street. Finally, injury-prevention practices were not coded for characters who were in life-threatening situations. For example, a character forced into a car at gunpoint was not assessed for safety belt use.

Data were recorded on standardized collection forms by a pair of reviewers who viewed each movie together so that questions regarding coding of injury practices could be discussed and differences reconciled. Two pairs of reviewers were used to code the movies. Comparisons between previous studies were analyzed by using χ^2 test of trend; Fisher's exact test was used if an expected cell size was <5. Significance testing was restricted to activities with ≥ 20 person-scenes in each study, and differences were considered significant if the *P* value was <.05.

TABLE 1 Activities and Safe Practices in G- and PG-Rated Movies, 1995–2007

Activity	Safe Practices	1995–1997 (N = 50) ¹¹		1998–2002 (N = 61) ¹²		2003–2007 (N = 67)	
		Movies, n (%)	No. of Safe Practices/No. of Person-Scenes (%)	Movies, n (%)	No. of Safe Practices/No. of Person-Scenes (%)	Movies, n (%)	No. of Safe Practices/No. of Person-Scenes (%)
Riding in a motor vehicle	Using the safety belt or a child safety seat	45 (90)	119/447 (27)	57 (93)	172/487 (35)	53 (79)	311/555 (56) ^a
Crossing the street as a pedestrian		32 (64)		39 (64)		37 (55)	
	Using the crosswalk		25/160 (16)		18/119 (15)		73/211 (35) ^a
	Looking both ways		20/109 (18)		19/89 (21)		11/102 (11)
Riding a bicycle	Wearing a helmet	15 (30)	4/64 (6)	12 (20)	6/40 (15)	14 (21)	8/32 (25) ^a
Riding in a boat	Wearing a PFD	10 (20)	14/82 (17)	9 (15)	0/23 (0)	9 (13)	60/80 (75) ^a
Riding a motorcycle	Wearing a helmet	3 (6)	3/5 (60)	9 (15)	20/28 (71)	10 (15)	23/41 (56)
Horseback riding	Wearing a helmet	3 (6)	2/7 (29)	5 (8)	0/19 (0)	7 (11)	4/20 (20)
Skateboarding		3 (6)		4 (7)		4 (6)	
	Wearing a helmet		0/3 (0)		4/8 (50)		5/11 (46)
	Wearing elbow pads		0/3 (0)		2/8 (25)		0/11 (0)
	Wearing knee pads		0/3 (0)		2/8 (25)		0/11 (0)
	Wearing wrist guards		0/3 (0)		0/8 (0)		0/11 (0)
Riding a scooter	Wearing a helmet	—	—	4 (7)	11/17 (65)	—	—
Rollerblading		8 (13)		3 (5)		2 (3)	
	Wearing a helmet		28/42 (67)		1/3 (33)		3/6 (50)
	Wearing elbow pads		30/42 (71)		0/3 (0)		3/6 (50)
	Wearing knee pads		30/42 (71)		2/3 (67)		3/6 (50)
	Wearing wrist guards		31/42 (74)		2/3 (67)		0/6 (0)
Riding a snowmobile	Wearing a helmet	1 (2)	1/7 (14)	2 (3)	6/13 (46)	1 (2)	1/1 (100)
Riding an ATV	Wearing a helmet	—	—	1 (2)	1/2 (50)	1 (2)	1/1 (100)

^a Significant change ($P < .05$) from previous studies. Significance testing was restricted to activities with ≥ 20 person-scenes in each study.

RESULTS

Sixty-seven (54%) of 125 movies met the inclusion criteria for the study (Table 1). Five movies (7%) were G-rated and 62 (93%) were PG-rated. Thirty-eight (57%) movies were comedies; 15 (22%) were action/adventure; 13 (19%) were children/family films; and 1 (1%) was a drama (Table 2). The movies reviewed in this study accounted for \$5.4 billion in box office receipts. The median domestic box office gross was \$66 million (range: \$20–\$250 million). Of the 125-movie sample, 58

(46%) movies were excluded: 32 (26%) were animated; 15 (12%) were not set in the present day; 8 (6%) were fantasy; and 3 (2%) were documentaries. Of the 67 movies meeting the inclusion criteria, 958 person-scenes involved characters with speaking roles participating in activities of interest; 524 (55%) depicted children and 434 (45%) adults. Twenty-two (2%) person-scenes involved a fall or crash, 3 person-scenes (<1%) resulted in injuries, and no person-scenes resulted in death. One injury was related to an

ATV, 1 injury resulted from horseback riding, and 1 injury was in a motor vehicle.

Seventy-nine percent of movies depicted characters riding in motor vehicles, with a median of 5 person-scenes per movie (range: 1–63). Of 555 person-scenes, 311 (56%) depicted characters wearing safety belts correctly. No significant differences in safety belt usage according to age, gender, or movie rating were noted.

Fifty-five percent of movies depicted pedestrians crossing a street, with a median of 2 person-scenes per movie (range: 1–12). Of 211 pedestrian person-scenes, 73 (35%) depicted pedestrians using a crosswalk. Forty-one (47%) of 87 children crossed the street in crosswalks, compared with 32 (26%) of 124 adults ($P < .001$). No significant differences in crossing the street in a crosswalk were noted according to gender or movie rating. Of 102 pedestrian person-scenes, 11

TABLE 2 Ratings and Categories of Movies, 1995–2007

Ratings and Categories	1995–1997 (N = 50), ¹¹ No. of Movies (%)	1998–2002 (N = 63), ¹² No. of Movies (%)	2003–2007 (N = 67), No. of Movies (%)
Rating			
G	4 (8)	11 (18)	5 (7)
PG	46 (92)	52 (82)	62 (93)
Category			
Action/adventure	1 (2)	4 (7)	15 (22)
Children/family	20 (40)	13 (21)	13 (19)
Comedy	25 (50)	31 (51)	38 (57)
Drama	3 (6)	6 (10)	1 (2)
Other	1 (2)	7 (11)	0 (0)

(11%) depicted pedestrians looking both ways before entering a street. No significant differences in looking both ways according to gender, age, or movie rating were noted.

Twenty-one percent of movies depicted characters bicycling, with a median of 1 person-scene per movie (range: 1–6). Of 32 person-scenes, 8 (25%) bicyclists wore helmets. Three (13%) of 24 children wore helmets, compared with 5 (63%) of 8 adults ($P < .02$). No significant differences in bicycle helmet use were observed according to gender or movie rating.

Thirteen percent of movies depicted characters boating, with a median of 3 person-scenes per movie (range: 1–32). Of 80 boating person-scenes, 60 (75%) depicted boaters with PFDs. Forty-nine (92%) of 53 children wore their PFD, compared with 11 (41%) of 27 adults ($P < .001$). No significant differences were noted according to gender; movie rating was not examined because no G-rated movies had boating scenes.

Eighty additional person-scenes involved other recreational activities (eg, riding a motorcycle, horseback riding, skateboarding, rollerblading, snowmobiling, and riding an ATV). Each of these activities occurred in 10 (15%) movies or less.

Comparison With Previous Studies

The proportion of characters wearing safety belts ($P < .0001$), crossing in crosswalks ($P < .0001$), wearing bicycle helmets ($P < .05$), and wearing PFDs ($P < .0001$) increased significantly from the earlier studies (Table 1). No significant change occurred in

the proportion of characters looking both ways before crossing the street.

DISCUSSION

The entertainment industry has improved the depiction of injury-prevention practices in popular movies likely to be viewed by children. However, prevention practices are still underrepresented compared with national averages. During 2003–2007, safety belt use in G- and PG-rated movies averaged 56%; safety belt usage by the US population during the same period was 82%.²⁴ Bicycle helmet use among children in the United States in 2003 was estimated at 41%,²⁵ whereas helmet use was depicted in only 25% of person-scenes in G- and PG-rated movies. Our findings are consistent with other studies that showed that injury-prevention practices were less frequent in movies than in real life.^{26,27}

As documented in previous studies, movies rarely showed the consequences of unsafe behaviors.^{11,12} For example, characters were often depicted walking away from falls and crashes that would most likely require hospitalization or result in death in the real world. These depictions might cause children to minimize the dangers associated with risky behaviors.

This study was subject to at least 2 limitations. First, 47% of the top-grossing movies of 2003–2007 did not meet the inclusion criteria, which might limit the generalizability of our results. Second, we only coded injury-prevention practices for characters with speaking roles, and scenes often contained nonspeaking characters. Our results, therefore, represent an underestimate of the person-scenes that the audience potentially viewed.

The improvement in the depiction of injury-prevention practices in G- and PG-rated movies may have been the result of 2 factors. Movie depictions might be representing changes in societal norms as more individuals adopt recommended safety practices. The entertainment industry may also have a heightened awareness of injury-prevention practices in children's movies as a result of multiple studies published in recent years.^{6–9,11,12,26,27} Collaborative efforts to address this issue have been made by advocacy groups and trade organizations such as the Entertainment Industry Council.

CONCLUSIONS

Because approximately one half of scenes still depict unsafe practices and the consequences of these behaviors are rarely shown, we recommend that the entertainment industry continue to improve the depiction of injury-prevention practices in movies marketed for children. The Motion Picture Association of America could consider injury-prevention practices when establishing criteria for rating movies. Parents should also take an active role by highlighting unsafe depictions in movies and educating their children on appropriate injury-prevention practices. Clinicians should consider the impact of media portrayals of injury-prevention practices when counseling children.

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