A National Survey About Parent Awareness of the Risk of Severe Brain Injury From Playing Football

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Abstract: *A survey was conducted to determine the level of awareness among parents of high school football players about the risk of severe brain injury. A national sample of 1007 randomly selected households was interviewed by telephone during February, 1992. All interviewees were parents of high school football players who either were currently playing football or had played within the previous 5 years. Survey questions measured the extent to which parents were aware both of the risks associated with playing high school football and the existing helmet warnings about those risks. Overall, the survey results demonstrated that parents of high school football players were uninformed about both the risk of severe brain injury from playing high school football and the football helmet warnings about that risk. Specifically, unprompted, most parents mentioned broken bones, knee injuries, sprains, or shoulder injuries as hazards associated with playing football. Few parents mentioned severe brain damage, even when prompted. Further, the overwhelming majority of parents incorrectly believed that wearing a football helmet generally eliminated the risk of severe brain injury. Very few parents had received information from any source about the risks of head injury or had heard that no football helmet can provide complete protection against this hazard. Few parents were aware of the warning label on the helmet or knew what the label said, even when prompted. In short, parents were unaware of the risk of severe brain damage, misinformed about a football helmet's ability to protect against this risk, and uninformed about the football helmet warning label about this risk.*

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An analysis of product warnings, their purpose and potential impact, has some bearing on decisions relating to the use of football helmets designed to reduce the risk of serious head injury while playing football. The risk of injury from playing football is probably common knowledge. What may not be common knowledge, especially to parents, players, coaches, etc., is the full extent of the risk of injury. Stated another way, the potentially severe consequences associated with playing football may not be fully understood by those with a need to know, thus creating a condition of uncertainty among parents needing complete information to make effective decisions.

As testament to the severity of potential injury, one manufacturer of football helmets has stated in its promotional literature designed for football coaches, "when you get right down to it, the primary purpose of a football helmet is to protect the football player's brain from the damaging effects of external blows to his skull."[1] The National Operating Committee on Standards for Athletic Equipment (NOCSAE), warned that "head injuries had been traditionally the source of greatest concern in the game of football, accounting for 65 to 85% of all fatalities."

Football helmet manufacturers, recognizing the risk of such a severe hazard as brain injury, have used a variety of written, oral, and technologically driven communication channels to deliver safety messages to players and coaches about this risk. For example, catalogs and brochures have been mailed to high school football coaches; videotapes are available for coaches to show to players; interpersonal channels involving the manufacturers' sales force allow face-to-face exchange of information; posters are available for locker rooms; and warning labels have appeared for years both on and inside football helmets warning about the risk of severe brain injury and that a helmet may not prevent such injuries.

All of these methods and channels of communication may have provided safety information to coaches and players, but one key audience that may have been missed are the parents of those players, the very audience that may well be making the crucial decision about whether or not their child will play football. If they make this decision without the benefit of full knowledge about the potential risk of severe brain injury, they will predictably be making a decision in a state of uncertainty. The purpose of this study was to determine the level of awareness of parents of high school football players of the potential risk of severe brain injury from playing football.

Methods

Sample

A national sample of 1007 parents of high school football players was interviewed by telephone for this survey. Best Mailing Lists, Inc of New York City provided lists with names and phone numbers of 20,000 randomly selected households in the United States, stratified and organized by state according to 1990 US Census figures. Each household contained at least one male child between the ages of 13 and

19 years old. Households were screened for the presence of at least one child who either currently played high school football or had done so within the previous 5 years. Screening was achieved by asking, as the initial question during the telephone interview, whether or not a household had at least one male child between 13 and 19 years old who currently or previously played high school football. Ninety percent of the final sample of 1007 households had a child who was currently playing football, and 10% had a child who had played within the previous 5 years.

The sampling frame allowed for random selection of households and interview completion rates within each state to coincide with the exact proportion of households containing males between 13 and 19 years old within each state. Thus, for example, 71 interviews, or 7.1% of the total number interviewed, were from households in Texas; 7.1% was the exact proportion of the total number of households with males between 13 and 19 years old within the United States residing in Texas at the time the lists were purchased. The 71 interviews completed in Texas were from households randomly selected from the lists available of Texas households. Either the male or female head of the household was randomly selected to be interviewed, in accordance with a process stratified to represent the exact population proportion of males and females in such households. For example, the number of households in the United States containing males between 13 and 19 years of age that have a female adult parent present (either alone or with a spouse) is 60%; 61.8% of those interviewed in this survey were female adults, producing a very close "fit" to the overall population. Up to three callbacks were allowed in order to reach each household. A similar procedure was followed for each of the 50 states, resulting in a sampling error of ±3% for this national survey.

Interviewing

All interviews were completed by telephone between January 27 and February 8, 1992. Each completed interview lasted approximately 7 to 8 minutes. All calls were made on-site by members of the professional interviewing staff of Goldhaber Research Associates, a national opinion research organization located in Amherst, NY. Interviewees used a Computer-Assisted Telephone Interviewing (CATI) system supported by survey software provided by The Survey System of San Francisco. All interviewing was supervised on-site, as well as by use of a Melco silent monitoring system which allowed additional supervisors to listen to and monitor a random sampling of the interviews. Two short pilot tests were conducted approximately 2 weeks prior to the start of interviewing in order to pretest both the survey questionnaire (its length, language, etc.) and the interviewing procedures. Results of the two pilots, conducted in Buffalo, NY and Austin, Tex, indicated that the survey questionnaire and procedures, with very minor modifications, were appropriate for both the target audience and the study's intended objectives.

Results

Overall, parents surveyed were uninformed about both the risk of severe brain injury from playing high school football and the existing helmet warnings about that risk.

Risk Awareness

Unprompted, most parents mentioned broken bones, knee injuries, sprains, or shoulder injuries as being associated with playing high school football. While 546 (54%) of parents mentioned knee injuries and 406 (40%) mentioned broken bones, hardly any parents (less than 1%) mentioned severe brain damage as being associated with playing high school football (Table 1).

Even when prompted, the results were not much different. Almost all parents (better than 90%) again associated either knee injuries (972) or broken bones (916) with football, while very few (249; 25%) mentioned severe brain damage (Table 2). Not only did almost all parents fail to associate brain damage with football playing, but, almost 790 (80%) believed that wearing a football helmet would generally eliminate most of the risk of severe brain injury (Table 3).

Information Sources

Very few parents had received information from any source about the risks of head injury or had heard that a football helmet cannot provide complete protection against this risk. Only 108 (11%) of the parents had received such information, mostly from written notices or permission slips from their child's high school or from a newspaper or television documentary (Table 4). Of the 108 respondents who had received information from one or more sources, only 5 (<.5%) parents, had received such information from the football helmet's warning label. In a separate question, about one in four parents (278; 27.6%) had never heard that a football helmet cannot provide complete protection against the risk of severe brain injury.

Table 1.—Unprompted Risk Awareness of High School Football Injuries (N = 1007; respondents were allowed up to three responses)

Question: What types of injuries do you think of as being associated with playing high school football?

Type of Injury	n	%
Knee injuries	546	54.2
Broken bones	406	40.3
Sprain type injuries	219	21.7
Shoulder injuries	143	14.2
Broken neck	79	7.8
Mild concussions	78	7.7
Severe brain damage	6	.6

Table 2.—Prompted Risk Awareness of High School Football Injuries (N = 1007; multiple responses allowed)

Question: Now, I'm going to read you a list of injuries some people have associated with playing high school football. Please tell me if you associate each of the following with playing high school football.

Type of injury	n	%
Knee injuries	972	96.5
Broken bones	916	91.0
Mild concussions	839	83.3
Shoulder injuries	824	81.8
Broken neck	499	49.6
Severe brain damage	249	24.7

Table 3.—Beliefs About Football Helmet Protection (N = 1007)

Question: Do you believe that wearing a helmet while playing football generally eliminates the following risks?

Risk	n	%
Severe brain injury	790	78.4
Mild concussion	702	69.7
Broken neck	293	29.1

Table 4.—Sources of Information About Risk of Head Injury

Question: Have you received information from any source regarding head injury risks associated with high school football? (N = 1007)

Response	n	%
Yes	108	10.7
No	886	88.0
Not sure	13	1.3

Question: (If "yes"; N = 108) from what source or sources did you receive this information?

Information source	n	%
Written notice from school	34	31.5
Newspaper/TV documentary	23	21.3
Football coaches	17	15.7
Helmet manufacturer	7	6.5
Helmet warning label	5	4.6
Parents meetings	4	3.7

Warning Label Awareness

Few parents were aware of the warning label on the football helmet or knew what the label said, even when prompted. About one in three (372; 36.9%) parents had heard that there is a warning label on football helmets, but, unprompted, less than one in five could correctly identify at least one piece of information from that label (Table 5). Of those who had heard of the label, 304 (81.8%) either could not give any or gave an incorrect response when asked to tell what the label said. Of the 68 (18.2%; representing less than 7% of the entire sample interviewed) who correctly identified at least one part of the label, only eight respondents (2.2% of those who had heard of the label) mentioned the risk of severe brain injury. Even when prompted with portions of the warning label read to them, only 212 (21%) of the parents had heard of the message on this warning label (Table 6).

Discussion

Human communication is the process by which people create and exchange messages with each other to reduce the uncertainty we face from environmental factors. The more complex the task, the greater the number of decisions and, consequently, the greater the amount of uncertainty we confront, thus requiring more information from messages to reduce our uncertainty. Uncertainty is defined as the difference between the information available and the information we need to make decisions.[4–6,15,21] When we have adequate information to meet our needs, we reduce our uncertainty and make more effective decisions in our lives; the converse is true with inadequate information.

Contemporary communication theory argues that, while humans are information-processing units that interact with their environments to remove as much uncertainty as possible, they tend to process only those informational inputs that are relevant to them.[6,15] Such is also the case if one views safety warnings as a type of informational input.

Safety warnings are messages that are created and exchanged to allow individuals to cope with environmental uncertainty in their relationship with products they or their family members use. Effective warnings are messages that communicate to consumers that, based upon scientific knowledge, there is some danger associated with their use of a product.[7,18–22] Once a warning message has been communicated to its proper target audience (in communication theory, "the receiver"), those who must make decisions about a product's use, the receiver, assuming the message has been received and understood, is able to reduce his or her uncertainty and make an informed choice about appropriate behavior.

As indicated above, it is important that safety information be communicated to those who must make decisions about how to use a product safely. Studies that measure the impact of safety warnings have shown that whether an individual will tend to process information from warnings is directly related to his or her familiarity with the product.[2,3,8–14,16,17] The more

Table 5.—Unprompted Helmet Warning Label Awareness

Question: Have you heard that there is a warning label on football helmets? (N = 1007)

Response	n	%
Yes	372	36.9
No	598	59.4
Not sure	37	3.7

Question: Could you tell me what it said? (N = 372)

Response	n	%
No/don't know	261	70.2
Incorrect response	43	11.6
Correct response	68	18.2*
No helmet can prevent all injuries	61	16.4
Do not strike opponent with helmet	19	5.1
Risk of severe brain or neck injury	8	2.2
You use this helmet at your own risk	5	1.3

*** Multiple responses possible.**

Table 6.—Prompted Helmet Warning Label Awareness (N = 1007)

Question: There is a warning on high school football helmets that includes the following: "Do not strike an opponent with any part of this helmet or face mask. This is a violation of football rules and may cause you to suffer severe brain or neck injury, including paralysis or death." It also states "No helmet can prevent all such injuries." Have you heard that this information is on all scholastic football helmets?

Response	n	%
Yes	212	21.0
No	753	74.8
Not sure	42	4.2

familiar individuals are with the product, the less likely they will perceive the product as hazardous and notice or read a product warning message.[3,5,10,11,16] This finding is particularly true with regard to teenage males, an audience typically willing to assume greater amounts of risk and more likely to ignore warnings about safety risks.[10,11,22]

As the above results indicate, parents were unaware of the risk of severe brain damage from playing high school football, misinformed about a football helmet's ability to protect against this risk, and uninformed about the existence and contents of the warning label about this risk on the football helmet. If parents are indeed an important audience for the information about this risk and are expected to make informed decisions about granting permission for their child to play high school football, it is apparent that they are making these decisions without the appropriate information necessary to reduce their uncertainty. If the parent is expected to learn about the risk of brain injury from the typical parental consent form from the high school, that source of information would be quite inadequate to convey information about the specific consequences addressed in this survey. Many such forms use language addressing general rather than specific risks, with phrases such as "even though protective equipment is worn by the athlete whenever needed, the possibility of an accident still remains." Given that, according to this survey, parents would probably associate the words "possibility of an accident" with broken bones or knee injuries, this language is not adequate to warn about the risk of severe brain damage.

Another possible source of information about this risk could be the football player. Assume that the warnings about the risk of brain damage were effectively communicated by helmet manufacturers both to high school football coaches, and then to high school football players and potential players by the coaches. There is no evidence that the players have or would communicate this information to their parents (especially prior to a parent signing a permission form). While a national survey of football coaches might document the level of awareness among coaches about this risk and the degree to which they have communicated the relevant information to their players, there is ample evidence in this current survey to indicate that even those few parents who have received information about this risk did not receive it from their child who plays football. This is not surprising since high school football players, for the most part, would be teenage males, the audience least likely to receive, process, and adhere to safety and warning messages.[3,11,13,14]

Role of the Football Helmet Manufacturer

If football helmet manufacturers expect or hope that football players will communicate relevant safety information about this or any other risks associated with playing football to their parents, this would not be a reasonable assumption given the risk-taking propensity of teenage males. There are many better, direct, and potentially more effective means available to helmet manufacturers to communicate safety information to parents.

Given that helmet manufacturers have access to the available scientific literature, NOCSAE tests and standards, and information about the risk of severe brain injury from playing football, it is only appropriate that they be the source to communicate all necessary safety information and warnings to users and potential users of their helmets, as well as all concerned parties, including parents of potential or current football players.

Not only do manufacturers have the information and credibility behind the information, they also have the means to deliver the message to parents. Manufacturers could recommend, via letters, brochures, and face-to-face meetings with sales representatives, that coaches and athletic trainers hold parent meetings at which a videotape presentation containing risk and safety information is shown to parents. Manufacturers could also provide written information (brochures, letters, placards, etc.) to distribute to parents attending these meetings, or by mail to others. Further, since helmet warning labels need to be replaced when the helmet is reconditioned and many high schools regularly use reconditioned helmets, an additional card could easily be attached to the helmet for distribution to the parents providing them with relevant safety information.

Given that parents today are not aware of the risk of brain injury from playing football and incorrectly believe that a football helmet will protect their child from such risks, now is the time for helmet manufacturers to lead a concerted effort to provide parents with the information they need to make informed decisions about matters of safety concerning their football-playing children.

The Role of Athletic Trainers

Athletic trainers have an important role to play, both in gathering information essential for informed decision making and in effectively communicating necessary information to parents so that they have an opportunity to make an informed decision about their children's participation in organized football. On the information-gathering front, manufacturer and reconditioner testing of football helmets reveals a significant degree of variation in performance, depending on such factors as helmet brand, model, size, and age. Despite this fact, a critical information gap exists in the availability of catastrophic head injury incidence reporting that is linked with information about the particular brand, model, size, and age of the helmet involved. To date, the only entities that possess such information are the helmet manufacturers, who typically investigate reports of catastrophic injury occurrences when their product is believed to have been involved. Athletic trainers, both individually and through their group organizations, should exert pressure on helmet manufacturers to make this important information available for study and analysis. Perhaps more importantly, athletic trainers are ideally positioned to initiate and operate their own reporting network nationwide so that reliance on manufacturer cooperation would not be necessary in the future. This reporting network could collect information concerning incidents involving head trauma (from mild concussion to subdural hematoma) in practice or game situations and include relevant information about the particular helmet involved. Once gathered, this information could be analyzed and made available to the interested public and athletic trainers.

On the communication front, athletic trainers, in conjunction with coaches and other team officials, should actively participate in the process of providing relevant information about potential risks and hazards of participation in football to parents. Such activities could include face-to-face communication with parents, written "disclosure" statements included in parental consent forms that require parent signature prior to a child's participation in football, and acquiring films, videotapes, and other informational vehicles that are available through helmet manufacturers and other sources, and making them "required" viewings at parent meetings prior to the start of the football season.

In summary, the following conclusions can be derived from this survey:

1. Most parents associated knee or shoulder injuries and broken bones with playing high school football.
2. While very few parents associated severe brain damage with playing high school football, most incorrectly believed that wearing a football helmet would generally eliminate that risk.
3. Very few parents had received information from any source regarding the risk of head injury or were aware of the helmet warning label and its contents.
4. Overall, parents were uninformed about both the risk of severe brain injury from playing high school football and the existing helmet warnings about that risk.

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