Prevention of spinal cord injuries caused by diving: evaluation of the distribution and usage of a diving safety video in high schools

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Abstract

Objective—To determine and assess the distribution and use of Sudden Impact, a potentially harmful video produced by Think First Canada's SportsSmart Canada, to help prevent spinal cord injury caused by careless shallow water diving. The target population was teenagers in the high-risk group (15–24 years old).

Design—Survey of 92 public secondary schools in the Metropolitan Toronto region.

Subjects—The heads of the physical and health education departments of the 92 public secondary schools in the Metropolitan Toronto region.

Results—The response rate was 66% (59 schools), of which 76% (45) had actually received the video. Forty one schools (91%) were aware that they had received the video reported using it. Eighty per cent of responding schools showed it to grade 11 students. Eighty per cent of schools with swimming pools used the video compared with only 42% of schools without swimming pools.

Conclusions—Although the video is a need, there are improvements in the system of distribution to ensure greater use of material such as this video. These may include direct distribution to principals, continuing contact with the schools, or mandatory inclusion of diving safety promotion into school curriculum.

Key words: diving; spinal cord injury; video; education

Spinocord injury is a major public health problem and a leading cause of disability.1,2 Sports and recreational related spinal cord injury represents 10%–30% of all such injuries in various countries.3 In Ontario, Canada from 1983–1987, diving accounted for 58% of all recreational related spinal cord injury.4 This amounts to approximately 60 major spinal injuries yearly caused by diving in this province alone.5 Although few of these injuries are fatal, many cause major disability because in almost all cases the cervical cord is involved.6 Ninety per cent of cord injuries due to diving result in complete or incomplete quadriplegia, whereas only 50% of spinal injuries in general result in all forms of quadriplegia.6

The typical victims of spinal cord injury caused by aquatic activities are teenage males, in unsupervised recreational activities in the summer months. Diving is the most frequent type of aquatic activity leading to spinal cord injury7 and almost 50% of these injuries involve persons between 15 and 24 years old. Many victims survive but incur lifelong disability and immense financial costs.

Methods

THE VIDEO

Because we believed most of these injuries were preventable, a research division of Think First Canada—Penser d'Abord, a national brain and spinal cord injury prevention program, produced a video. It was entitled Sudden Impact and designed to alert teenagers about diving related spinal cord injury. The focus of the video was on water diving and other careless behaviours associated with both supervised and unsupervised aquatic settings. The 20 minute video chronicles the histories of seven survivors of spinal cord injury all between 15 and 24, who are now quadriplegics as a result of a diving accident. It displays alarming statistics about shallow water diving and aquatic injury to illustrate the need for injury prevention. According to the video is a Leader's Guide, containing supplementary information, to be used by the classroom teacher as a tool for further classroom discussion.

EVALUATION

Although other evaluations of the Think First head injury and spinal cord injury prevention programs have been conducted,7–10 there has not been an objective assessment of a diving safety prevention strategy, such as Sudden Impact. Accordingly, the purpose of the present study was to assess the use and awareness of the video in public secondary schools in the process evaluation and not one addressing behavioural change.

MEASURES

A questionnaire was sent to the heads of the physical and health education departments of all 92 public secondary schools in the Metropolitan Toronto region. The questionnaire asked about the frequency of use of the video in the 1994–95 school year; its accessibility; the number of times it was shown; their grades; and how and where the video was used. Other questions addressed use of the Leader's Guide. Responses were not encouraged to supply any additional information.

All the public schools boards received the video but parent or separate school boards were excluded from the study. The questionnaire was sent by facsimile to the appropriate head of each school. Confirmation of its receipt was obtained through follow up telephone calls and facsimile calls. Each respondent received up to three follow up telephone calls if the questionnaire was not returned.

Results

The response rate was 64% (59 schools) of whom 80% (47) were aware of the Sudden Impact video. Ten, of whom 76% (45) reported that their school had received it. It is not evident why it failed to reach the remaining 24% (14). Ninety one per cent (41) of schools that had the video used it during the school year while the remainder stated that they planned to show it in the following year. Eighty per cent of schools with swimming pools showed the video compared with 42% of schools without swimming pools.

Sudden Impact was shown a mean of six times per school (range 1–39) to a mean of 174 students in each school (12–975). In all, 693 saw the video, however, the mean per cent of students in each school who saw it was only 16% (17%–95%). The video was shown to high school students in grades 9–13 (ages 14–18), although the per cent of each grade who saw it ranged from 29% to 74% only 46% of schools used the accompanying Leader's Guide to facilitate classroom discussion and for teacher preparation.

The "additional feedback" section of the survey contained no negative comments but some constructive criticisms. Thirty five respondents stated that the directness of the video strongly reinforced its message, and that students were very moved. Many students told their teachers that they would be more careful in the future and that they preferred that type of injury could not happen to them was dispelled by watching the video. The video also stimulated class discussion about the causes, nature, and severity of these injuries. Many teachers expressed the opinion that viewing the video should be mandatory. The most frequent criticism was that the video failed to mention nothumors of ethnic minorities.

Discussion

In the field of aquatic spinal injuries, several major prevention efforts have been launched in various countries in recent years. They include media campaigns, often involving celebrities, and various educational programs in high schools, changes in regulations concerning permissible depth for diving and other features of swimming pool design, and improved standards of spinal injury rescue and immobilization techniques. Nevertheless, many authors continue to emphasise the need for further prevention efforts.11–16

The timing of prevention strategies is considered crucial so that the messages reach the target population before the diving season begins.17,18 The survey showed that almost one quarter of the surveyed schools had not used the Sudden Impact video. This suggests that this is an effective way of providing important information to schools and encouraged to supply any additional information.

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The response rate of 64% prompts consideration about non-respondents. Some may not have replied because the survey was conducted at a busy time in the academic schedule. It is also likely that some non-respondents did not have the video, or were unaware of it, and therefore, did not participate. Clearly, there is a need to improve the method of distribution of this and similar educational materials.

It was interesting to note that the percentage of teenagers who saw the video at schools with a swimming pool was more than the percentage who saw it in schools without a pool. This result is not unexpected as schools with pools probably have better knowledgeable water safety more than the others. However, the students in the latter schools are less susceptible to spinal cord injury and must be reached equally. The only way to ensure this is by incorporating Sudden Impact into the physical and health education curriculum as mandatory viewing by all students.

A disappointing result was that only 16% of the students in each school saw the video. A likely explanation is that the video was shown most frequently in physical and health education classes and students enrolled in these courses only comprise between 15%–20% of the population in the school (physical and health education is not compulsory after grade 10). These findings suggest that future distribution of such materials should not be restricted to physical and health education department. A new strategy would be to send them to the headmaster or principal to ensure viewing by most students for example, in assemblies.

Implications for Programs

The school setting represents an ideal opportunity to teach injury prevention and reaches large numbers of students of diverse social and cultural backgrounds in an inexpensive fashion. The results suggest that the distribution mechanism requires major improvements as described above. Some method to ascertain receipt of the video such as a return postcard is essential. Continuing contact with the schools is likely to be necessary to encourage greater use of the material. Showing a video to assemblies especially as part of a compulsory curriculum on injury prevention would ensure greater use. These measures to improve the distribution and use of this prevention program should also apply to other school based injury programs. In all, however, parallel efforts are needed to ensure that the educational materials are used in the original intended manner.