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Sports- and Recreation-related Injury Episodes in the United States, 2011–2014

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Abstract

Objective—Much of the research on sports- and recreation-related injuries focuses on a specific population, activity, or type of injury, and national estimates of the total burden of sports- and recreation-related injuries are limited. This study provides national estimates of the injury burden and examines the distribution of sports- and recreation-related injuries across demographic groups, activities, and injury circumstances.

Methods—Information on medically attended injury episodes for persons aged 5 years and over were obtained from the 2011–2014 National Health Interview Survey. Sports- and recreation-related injuries are categorized by the associated activity using a classification scheme based on the *International Classification of External Causes of Injury*.

Results—An average annual estimate of 8.6 million sports- and recreation-related injury episodes was reported, with an age-adjusted rate of 34.1 per 1,000 population. Males (61.3%) and persons aged 5–24 years (64.9%) accounted for more than one-half of injury episodes. Injury rates were higher among males, children aged 5–14 years, and non-Hispanic white persons than for their counterparts. One-half of the sports- and recreation-related injury episodes (50.0%) resulted in treatment at a doctor's office or other health clinic without an emergency department visit or hospitalization. Overall, general exercise was the most frequently mentioned activity associated with sports- and recreation-related injuries, but types of activities varied across sex and age groups. Body regions injured while engaging in sports and recreation activities included the lower extremity (42.0%), upper extremity (30.3%), and head and neck (16.4%).

Conclusion—As the nation continues to recognize the importance of physical activity to maintain health, more research efforts are needed to examine sport and recreation injury across various activities, demographic groups, and health care settings, especially settings other than emergency departments and hospitals.

Keywords: exercise • nonfatal injury • National Health Interview Survey

Introduction

Clinicians and public health advocates frequently promote physical activity to maintain health and reduce the risk of obesity. Recent estimates show that 213 million Americans aged 6 years and over took part in sports and fitness activities in 2015, up from 209 million in 2014 (1). As more people engage in sports and recreation activities, injuries resulting from these activities pose an increasingly important public health concern (2–5).

Many epidemiological studies of sports- and recreation-related injuries focus on specific populations, activities, and outcomes. For example, multiple studies have looked at sports injuries among pediatric patients and athletes in organized sports (6). Football, soccer, and basketball are among the most frequently studied sports, and knee injuries, ankle sprains, and concussions are common outcomes in studies identifying risk factors for sports-related injuries (6). A limited number of studies provide national estimates on sports- and recreation-related injuries among all populations. These studies generally focus on emergency department (ED) visits using data from the National Center for Health Statistics' (NCHS) National Hospital Ambulatory Medical Care Survey (NHAMCS) (5,7–9), or the Consumer Product Safety Commission's National Electronic Injury Surveillance

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System–All Injury Program (2,10–12). Using NHAMCS data, researchers have provided several national estimates of sports- and recreation-related injury visits to the ED. For example, during 1997–1998, an estimated 3.7 million visits were made annually, and among them, 2.6 million involved persons aged 5–24 years (7). Sports and recreation activities were also the most frequently reported cause of injury-related ED visits among pediatric patients, representing approximately 1 in 5 injury-related ED visits among patients aged 19 and under (8,9). One study using data from 1999–2008 showed that sports accounted for 14% of all ED visits for life-threatening injuries, with a higher proportion seen for children aged 18 and under (32%) than for adults aged 19 and over (9%) (5).

Because they tend to include more severe injuries, studies using ED data may underestimate the overall burden of injury from sports and recreation activities. For a more comprehensive look, researchers have used NCHS' National Health Interview Survey (NHIS) to obtain estimates on all medically attended injuries, not just those resulting in an ED visit or hospitalization. A study using NHIS data from 1997–1999 estimated that 7 million Americans received medical attention for sports- and recreation-related injuries each year, and found that men, persons aged 5–24 years, and white persons reported higher rates than their counterparts (13). With increased participation in sports and recreation activities in recent years, updated estimates of the burden of sports- and recreation-related injuries in the United States are needed. In this study, the overall sex- and age-specific estimated numbers, percentages, and rates of medically attended sports- and recreation-related injuries are described across various demographic groups, sport activities, and injury circumstances using NHIS data from 2011–2014.

Methods

Source of injury data

NHIS collects information on various health topics via face-to-face interviews of a nationally representative sample of the noninstitutionalized population residing in the United States (14). Injury-related information is captured from questions in the Family Core section of the survey. These questions ask about medically attended nonfatal injuries that occurred for any family member in the 3 months prior to interview. An injury episode refers to a traumatic event in which a person was injured from an external cause. A medically attended injury episode is one for which a health care professional was contacted, either in person or by telephone, for advice or treatment. Up to 10 injury episodes are recorded for each person. The family respondent provides all information about the episode.

NHIS injury questions include both open-ended verbatim questions and structured multiple-choice questions. In the open-ended questions, respondents are asked to describe the conditions for each injury episode, including (1) the cause of injury, (2) the parts of the body that were injured, and (3) the type of injury (e.g., fractures, sprains or strains, or contusion). This information is used to assign *International Classification of Diseases, Ninth Revision, Clinical Modification* (ICD–9–CM) injury diagnosis and external cause codes (E codes) for all episodes.

Up to eight diagnosis (nature of injury) codes are assigned to each injury episode. Each injury episode must have at least one diagnosis code of 800–909.2, 909.9, 910–994.9, 995–995.59, or 998.80–995.85 and one external cause of injury code of E800–E848, E850–E869.9, E880–E929.9, or E950–E999. The diagnosis codes are categorized by body region and nature of injury according to the Barell Injury Diagnosis Matrix (15), with the exception of traumatic brain injury (TBI). Cases of TBI are identified using the surveillance case definition from the National Center for Injury Prevention and Control (16). In addition to the open-ended questions, respondents are asked to provide information about the activity at the time of the injury, the date and place of the injury occurrence, where the person received medical advice or treatment, and whether the person missed any days from work or school.

Creating the analysis data set

Using NHIS data from 2011–2014, initial case selection began with all medically attended injury episodes reported within 5 weeks prior to the date of interview. A reference period of 5 weeks was chosen to minimize the recall bias for less severe injuries (17). Episodes involving children aged 4 years and under were excluded because their participation in sports and recreation activities differed from that of older children and adults. Data from 5,052 injury episodes (unweighted) were reviewed for sports and recreation eligibility. Three researchers independently reviewed the verbatim text and coded information (e.g., activity and place of injury occurrence) for each record to determine whether an injury episode was related to sports and recreation. Differences among reviewers on whether a record should be included as a case were discussed and consensus reached. Twenty episodes had either missing or poor narratives such that eligibility for inclusion could not be determined. The final analysis file included 1,080 (unweighted) sports- and recreation-related injury episodes.

After determination of eligibility, each episode was assigned an activity code based on the sports module of the *International Classification of External Causes of Injury* (ICECI) (18). The sports module includes 20 broad categories of various sport activities as well as coded subcategories within each broad category. For comparative purposes, the sports and recreation categories reported in this study match those used in previous studies using data from NHIS (13) and NHAMCS (7). Rules for case determination and assignment of sports and recreation activities to an ICECI category were established for coding consistency. For example, all injury episodes involving pedal cycling were included. Riding a bicycle can serve the purpose of transportation, exercise, or both. Because some narratives for

injuries from pedal cycling did not provide sufficient detail, all pedal cycling, regardless of the purpose, was considered sports- and recreation-related. Due to lack of detailed information, all injuries related to skating (i.e., both ice skating and roller skating) were grouped into the same category. School-related injury episodes (i.e., physical education class) without a named activity were assigned to "School related (non-specific activity)." Details on the specific activity involved were lacking for 106 episodes; these were assigned to the activity category of "Unspecified."

Statistical analysis

NHIS is designed to provide national estimates by applying weights to a nationally representative sample. Data weighting procedures are described elsewhere (14). Point estimates and the corresponding 95% confidence intervals were calculated using SAS-callable SUDAAN, version 11.0.0 (RTI International, Research Triangle Park, N.C.), a software package that accounts for the complex sample design of NHIS. The denominators used in the calculation of rates were based on the NHIS study population aged 5 years and over for 2011–2014. Age-adjusted rates were calculated using the year 2000 standard population.

Annualized national estimates were computed by multiplying the 5-week injury episode weights by 10.4. The estimates for overall sports- and recreation-related injuries were calculated across sex, race and ethnicity, age group, place of occurrence, and place of medical care. Because the injured person might have received care in a variety of settings, injury episodes were categorized into mutually exclusive categories using the highest level of medical care received based on the following hierarchy: hospitalized overnight, ED visit, attendance by an emergency vehicle, doctor's office or clinic visit, call to a medical professional or poison control center, or care received anyplace else. Age-adjusted injury rates and percentages across various sports- and recreation-related activities were estimated for the entire study population and by sex. To identify differences by age group, injury estimates were calculated for the five leading sports- and recreation-related activities for age groups 5–14, 15–24, and 25 and over. Additionally, the annual number and percentage of injuries by external cause, nature of injury, and body region involved were also calculated.

Reliability of estimates was evaluated using the relative standard error (RSE), which is the standard error divided by the point estimate. Estimates were considered reliable if the RSE was less than 30%. Estimates by age group, gender, race and ethnicity, place of occurrence, place of medical care, activity at the time of injury, cause of injury, type of injury, and body region of injury were compared for statistically significant differences. The highest rate or percentage within each group is footnoted in Tables 1–4. For activity at the time of injury (Table 2), only the top five frequently mentioned activities were compared. To assess the significance of differences, two-tailed tests with no adjustments for multiple comparisons were performed. The critical value used for two-sided tests at the 0.05 level of significance was 1.96.

Results

Overall estimates

From 2011 through 2014, Americans aged 5 years and over sustained an average 8.6 million sports- and recreation-related injury episodes per year, or 34.1 episodes per 1,000 persons (Table 1). Sixty-five percent of these injury episodes involved persons aged 5–24 years, with the highest rate observed among children aged 5–14 years (76.6 per 1,000 persons). Males accounted for 61% of the sports- and recreation-related injury episodes, with a rate of 41.2 per 1,000 persons. In both sexes, the highest rate was seen for children aged 5–14, with rates of 86.0 episodes per 1,000 persons for boys and 66.8 episodes per 1,000 persons for girls. Among racial and ethnic groups, non-Hispanic white persons had the highest age-adjusted sports- and recreation-related injury rate (42.5 per 1,000 persons).

Among place of injury occurrence, approximately one-third of the sports- and recreation-related injury episodes occurred at a sport facility, athletic field, or playground, representing about 2.9 million episodes annually. One-half of the sports- and recreation-related injury episodes (or 4.3 million annually) resulted in treatment at a doctor's office or other health clinic without an ED visit or hospitalization, and more than one-third (36.6% or 3.2 million) resulted in an ED visit without further hospitalization. Approximately 230,000 sports- and recreation-related injury episodes (2.7%) resulted in hospitalization.

Activity-specific estimates, by sex

Table 2 shows the estimated annual number, percentage, and rate of sports- and recreation-related injury episodes by type of activity. General exercise was the most frequently mentioned activity in injury episodes for all persons (16.3%) and for females (18.6%). For males, the most frequently mentioned activities were general exercise (14.9%), football (12.4%), and basketball (12.2%) (estimates were not significantly different), followed by pedal cycling (7.1%) and recreational sports (6.5%). General exercise was further categorized into "Aerobics, exercising or weight-training," "Running or jogging," and "School related (non-specific) activity" such as recess or a physical education class without a specific sport mentioned. For all persons and for males, injury episodes resulting from aerobics, exercising, or weight training were more common than episodes resulting from running or jogging or nonspecific school-related activities. For females, the proportion of injuries that involved aerobics, exercising, or weight training (8.2%) was similar to the proportion involving running or jogging (7.2%).

Activity-specific estimates, by age group

The sports and recreation activity at the time of injury also differed by age group. Table 3 shows the top five activities among age groups 5–14 years, 15–24, and 25 and over. General exercise was frequently mentioned in all three age groups, accounting for 13.1%, 14.3%,

and 21.9% of the injury episodes for age groups 5–14 years, 15–24, and 25 and over, respectively. While gymnastics/cheerleading and football were frequently identified in the age groups 5–14 and 15–24, basketball was most common in age groups 15–24 and 25 and over. Pedal cycling was among the top five activities for age groups 5–14 years and 25 and over, but not for teenagers and younger adults aged 15–24. Injuries from playground activity were frequently seen for age group 5–14 years, and injuries from recreational sports and water-related activities were frequently seen for those aged 25 and over.

Estimates of injury by external cause, nature of injury, and body part injured

More than one-quarter of sports- and recreation-related injury episodes (27.9%) resulted from falls. Other causes such as overexertion, being struck by or against a person or object, or transportation each accounted for 12%–17% of the injury episodes (Table 4). The majority of the injury diagnoses involved strains and sprains (41.4%), fractures (20.0%), and superficial injuries and contusions (19.0%). Sports-related TBI, which has received increasing public and research attention, accounted for 4.5% of the total injury diagnoses. The parts of the body most frequently injured while engaging in sports and recreation activities were lower extremity (42.0%), upper extremity (30.3%), and head and neck (16.4%).

Discussion

Research efforts to understand the patterns, risk factors, and physiology of sport injuries provide insights that can help inform prevention and treatment approaches. While many studies have focused on specific sport activities, particularly organized sports, the patterns of injury associated with individual sports, especially those engaged in by nonathletes, have not been well-described. The narratives from NHIS injury data not only provide an in-depth understanding of the circumstances surrounding the injury event, but also enable researchers to better estimate the burden of sports- and recreation-related injuries for both organized and individual activities. In addition, the inclusion of all medically attended injury episodes in NHIS provides estimates on injury episodes beyond traditional ED visits and hospitalizations.

This study presents updated estimates on nonfatal medically attended sports- and recreation-related injuries across various demographic groups, activities, and injury circumstances in the United States. From 2011 through 2014, an estimated 8.6 million sports- and recreation-related injury episodes occurred annually, with a rate of 34.1 episodes per 1,000 persons for persons aged 5 years and over. Although the 2011–2014 estimate was greater than that reported in 1997–1999 (6.8 million episodes, 27.2 per 1,000 persons) (13), suggestion of an increase in the sports- and recreation-related injuries in the past 15 years should be considered with caution. Differences in survey design, duration of reference (recall) period, and classification of certain sport and recreation activities may hinder direct comparison. However, this study's findings of higher proportions and rates of sports- and recreation-related injuries for males, non-Hispanic white persons, and persons aged 24 and under were consistent with the earlier NHIS study (13).

Although differences in methodology limit the direct comparison of estimates between 1997–1999 and 2011–2014, distribution of the injury episodes by activity provides insight into the patterns of these injuries in recent years. In 2011–2014, general exercise (16.3% of sports- and recreation-related injury episodes), basketball (9.9%), and football (8.3%) were among common activities resulting in sports- and recreation-related injury. In contrast, during 1997–1999, the most common activities identified were basketball (14.4%), pedal cycling (9.6%), and recreational sports (9.5%).

Results from this study also indicate that the activities at the time of sports- and recreation-related injuries differ by sex and age group. In contrast to males, none of the three most frequently mentioned activities for females included team sports. While injuries related to general exercise, playground equipment, and gymnastics were more common for children aged 5–14, injuries from organized sports such as basketball, soccer, and football were frequently seen among those aged 15–24. For adults aged 25 and over incurring injuries, individual activities such as general exercise, recreational sports, pedal cycling, and water sports were more common.

The differences in the distribution of activities among sports- and recreation-related injury episodes by sex and age group may be partially explained by the level of participation in these sports. According to the Sport and Fitness Industry Association (19), from 2009 through 2012, the U.S. population aged 6 years and over showed a trend in higher participation rates in exercise and fitness activities, particularly in aerobic activities (including use of stationary exercise machines), running and jogging, strength-training activities, and gymnastics than in organized sports. Among organized sports, more Americans participated in basketball than any other team sports, while participation rates from 2009 through 2012 decreased for baseball and football (19). In addition, according to a 2015 telephone poll developed by Harvard Opinion Research Program (20) and the 2003–2010 American Time Use Survey (21), males are more likely to participate in sports and exercise than females. Compared with males, females also had a lower participation rate in team sports but a higher participation rate in aerobics, yoga, and dancing (21).

In terms of the cause or mechanism of injury, this study found that falls, overexertion, and being struck by or against an object or a person accounted for more than one-half of the injury episodes (60.1%), with falls being the most common cause. This finding was similar to that reported in a study using NHIS data, which identified the most common mechanisms involved in recreational injury (22). In the body regions injured and the type of anatomical injury that occurred, the upper and lower extremities were the most common body regions associated with sports and recreation injuries. Similar to other studies, the most common injury diagnoses were sprains and strains, fractures, superficial injuries, contusions, and open wounds (7,9,13).

One-half of the sports- and recreation-related injury episodes were presented to a doctor's office or other health clinic without a further ED visit or hospitalization (4.3 million episodes). This supports earlier observations from the Netherlands that one-half of all sports- and recreation-related injuries were seen by general practitioners (23). The current study estimates that 2.2 million sports- and recreation-related injury episodes among children aged 5–19 years were presented to a doctor's office annually, which is similar to estimates from a study using National Ambulatory Medical Care Survey data from 1997–1998 (2.7 million injury visits to a primary care office) (24). Although sports- and recreation-related injuries presenting to a doctor's office are likely to be less severe than ones presenting to EDs, the findings suggest a need for more injury research in alternative non-ED and nonhospitalization settings.

Several study limitations should be noted. NHIS injury data may be subject to recall bias due to the retrospective reporting method and use of proxy. Although NHIS interviews are conducted year-round and weights are used for annualized estimates, the 5-week recall period used in this study may still introduce seasonal effects. In addition, the narratives for approximately 10% of the sports- and recreation-related injury episodes lacked essential details for categorizing the sport activity involved. It is unknown how the appropriate categorization of these episodes would affect the overall distribution across the sport activity categories. Compared with episodes that mention specific sports and recreation activities, episodes that could not be categorized had a similar demographic distribution but were less likely to occur at school or on a river, lake, stream, or ocean, or to result from transportation-related events (data not shown). Finally, the lack of data on participation rates for different sports and recreation activities prevents evaluation of the risk of injury for individual sports.

The findings from this study provide updated information on the demographics, types of activity, and injury diagnoses associated with sports- and recreation-related injuries. These findings can be used to develop recommendations for prevention strategies and further research. Results from this study also suggest that a substantial proportion of sports- and recreation-related injuries are treated in health care facilities other than a hospital or ED. As the nation continues to recognize the importance of physical activity, more research efforts are needed to address the complexity of these injuries across various activities, demographic groups, and medical settings.

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Table 1. Estimated annual number, percentage, and age-adjusted rate of sports- and recreation-related injury episodes among persons aged 5 years and over, by selected characteristics: United States, 2011–2014

Characteristic	Number, in thousands (percent)[1]	Rate (95% CI)[2]
Total	8,599 (100.0)	34.1 (31.6–36.5)
Sex		
Male	5,275 (61.3)	[3]41.2 (37.6–44.8)
Female	3,324 (38.7)	27.0 (23.7–30.2)
Age group (years)		
5–14	3,179 (37.0)	[3]76.6 (68.4–84.8)
15–24	2,400 (27.9)	55.6 (47.9–63.4)
25–44	1,790 (20.8)	21.9 (18.4–25.3)
45 and over	1,229 (14.3)	9.8 (7.9–11.7)
Male:		
5–14	1,823 (34.7)	[3]86.0 (74.4–97.6)
15–24	1,498 (28.4)	68.7 (57.1–80.2)
25–44	1,179 (22.3)	29.2 (23.5–34.9)
45 and over	775 (14.7)	13.1 (10.0–16.2)
Female:		
5–14	1,356 (40.8)	[3]66.8 (55.6–78.1)
15–24	902 (27.1)	42.3 (32.2–52.4)
25–44	612 (18.4)	14.7 (10.7–18.8)
45 and over	454 (13.7)	6.8 (4.7–9.0)
Race and ethnicity		
Hispanic	961 (11.2)	18.3 (15.1–21.6)
Non-Hispanic white	6,172 (71.8)	[3]42.5 (38.8–46.2)
Non-Hispanic black	769 (8.9)	23.6 (18.5–28.7)
Non-Hispanic other races	696 (8.1)	33.1 (25.1–41.2)
Place of injury occurrence		
Home (inside)	374 (4.0)	1.3 (0.8–1.8)
Home (outside)	1,101 (12.8)	4.6 (3.7–5.5)
School	1,961 (22.9)	8.6 (7.4–9.8)
Street, highway, curb	494 (5.8)	1.8 (1.3–2.3)
Sport facility, athletic field, playground	2,973 (34.7)	[3]11.4 (9.9–12.8)
Park or recreation area	785 (9.1)	2.9 (2.2–3.6)
River, lake, stream, ocean	361 (4.2)	1.3 (0.8–1.8)
Other	547 (6.4)	2.1 (1.5–2.7)
Place of medical care[4]		
Call to medical professional	250 (2.9)	0.9 (0.6–1.3)
Doctor's office or clinic	4,298 (50.0)	[5]16.5 (14.7–18.2)
Emergency vehicle	388 (4.5)	1.4 (1.0–1.9)
Emergency department	3,150 (36.6)	[5]13.1 (11.6–14.6)
Hospitalized overnight	229 (2.7)	0.9 (0.5–1.3)
Anyplace else	283 (3.2)	1.2 (0.6–1.7)

[1]Numbers and percentages may not sum to total due to rounding.

[2]Rates are per 1,000 persons with 95% confidence interval (CI).

[3]Indicates highest rate within the group ($p < 0.05$).

[4]Mutually exclusive categories using the highest level of medical care received based on the following hierarchy: hospitalized overnight, emergency department visit, attendance by an emergency vehicle, doctor's office or clinic visit, call to a medical professional or poison control center, or care received anyplace else.

[5]Indicates rates were similar between doctor's office or clinic and emergency room, but higher than other places of medical care ($p < 0.05$).

SOURCE: NCHS, National Health Interview Survey, 2011–2014.

Table 2. Estimated annual number, percentage, and age-adjusted rate of sports- and recreation-related injury episodes among persons aged 5 years and over, by type of activity and sex: United States, 2011–2014

Activity	Total		Male		Female	
	Number, in thousands (percent)[1]	Rate (95% CI)[2]	Number, in thousands (percent)[1]	Rate (95% CI)[2]	Number, in thousands (percent)[1]	Rate (95% CI)[2]
General exercise	[3]1,404 (16.3)	5.3 (4.4–6.2)	[4]786 (14.9)	5.9 (4.6–7.2)	[3]618 (18.6)	4.8 (3.5–6.0)
Aerobics, exercising, or weight training	[5]678 (7.9)	2.2 (1.6–2.7)	[5]408 (7.8)	2.7 (1.8–3.7)	[6]270 (8.2)	1.6 (1.0–2.3)
Running or jogging	457 (5.3)	1.8 (1.3–2.4)	224 (4.3)	1.7 (1.0–2.4)	[6]234 (7.1)	1.9 (1.1–2.8)
School-related (nonspecific)	269 (3.1)	1.3 (0.8–1.8)	154 (2.9)	1.4 (0.8–2.1)	[7]115 (3.5)	1.2 (0.5–1.9)
Basketball	851 (9.9)	3.3 (2.6–4.0)	[4]642 (12.2)	4.7 (3.6–5.9)	209 (6.3)	1.8 (1.1–2.6)
Football	712 (8.3)	3.1 (2.3–3.8)	[4]653 (12.4)	5.5 (4.1–6.9)	[7]59 (1.8)	[7]0.5 (0.0–1.0)
Pedal cycling	615 (7.2)	2.5 (1.8–3.1)	375 (7.1)	3.0 (2.0–3.9)	240 (7.2)	1.9 (1.1–2.8)
Soccer	545 (6.3)	2.1 (1.5–2.7)	313 (5.9)	2.5 (1.6–3.4)	233 (7.0)	1.7 (1.0–2.4)
Recreational sport[8]	520 (6.0)	1.8 (1.2–2.3)	342 (6.5)	2.0 (1.2–2.7)	179 (5.4)	1.3 (0.7–1.9)
Gymnastics/cheerleading	474 (5.5)	2.1 (1.5–2.8)	[7]95 (1.8)	[7]0.9 (0.3–1.5)	379 (11.4)	3.4 (2.2–4.5)
Baseball/softball	403 (4.7)	1.6 (1.1–2.1)	232 (4.4)	1.8 (1.0–2.6)	171 (5.1)	1.4 (0.7–2.0)
Other team sport[9]	372 (4.3)	1.5 (0.9–2.0)	180 (3.4)	1.4 (0.7–2.0)	192 (5.8)	1.7 (0.8–2.5)
Water sport	364 (4.2)	1.4 (0.9–1.8)	207 (3.9)	1.5 (0.8–2.2)	158 (4.7)	1.3 (0.6–1.9)
Other individual sport[10]	358 (4.2)	1.4 (0.9–1.9)	210 (4.0)	1.6 (0.9–2.3)	148 (4.5)	1.1 (0.5–1.8)
Playground equipment	330 (3.8)	1.7 (1.1–2.2)	177 (3.4)	2.2 (1.4–3.1)	[7]153 (4.6)	1.6 (0.8–2.4)
Combative sport	291 (3.4)	1.2 (0.7–1.6)	231 (4.4)	1.9 (1.1–2.6)	[7]60 (1.8)	[7]0.5 (0.1–0.8)
Snow sport	285 (3.3)	1.1 (0.6–1.6)	148 (2.8)	1.1 (0.5–1.7)	[7]137 (4.1)	[7]1.1 (0.4–1.8)
Ice or roller skating/skateboarding	162 (1.9)	0.7 (0.3–1.0)	[7]76 (1.4)	[7]0.7 (0.2–1.2)	[7]86 (2.6)	[7]0.7 (0.2–1.1)
Unspecified	910 (10.6)	3.5 (2.7–4.3)	607 (11.5)	4.7 (3.3–6.1)	303 (9.1)	2.3 (1.4–3.1)

[1]Numbers and percentages may not sum to total due to rounding.

[2]Rates are per 1,000 persons with 95% confidence interval (CI).

[3]Indicates highest percentage among the top five frequently mentioned activities ($p < 0.05$).

[4]Indicates percentages were similar between general exercise, basketball, and football, but higher than pedal cycling and recreational sports among the top five frequently mentioned activities ($p < 0.05$).

[5]Indicates percentages were higher than running or jogging and school-related (nonspecific) activities ($p < 0.05$).

[6]Indicates percentages were similar between "aerobics, exercising, or weight training" and "running or jogging" but higher than school-related (nonspecific) activities ($p < 0.05$).

[7]Estimates may be unstable because they are based on fewer than 20 cases or have a relative standard error of 30% or more.

[8]Includes tennis, racquetball, badminton, and other racquet sports, as well as golf, bowling, fishing, hunting, hiking, mountain climbing, and other leisure sports.

[9]Includes volleyball, rugby, hockey, lacrosse, cricket, and other team sports.

[10]Includes all other sport and recreation categories, such as horseback riding, riding an all-terrain vehicle, playing catch, and other nonteam activities.

SOURCE: NCHS, National Health Interview Survey, 2011–2014.

Table 3. Estimated annual number, percentage, and rate of sports and recreation injury episodes for persons aged 5 years and over, by leading types of activities and age group: United States, 2011–2014

	5–14 years			15–24 years			25 years and over		
Order	Activity	Number, in thousands (percent)	Rate (95% CI)[1]	Activity	Number, in thousands (percent)	Rate (95% CI)[1]	Activity	Number, in thousands (percent)	Rate (95% CI)[1]
1	General exercise[2]	417 (13.1)	10.1 (7.2–13.0)	Basketball	343 (14.3)	7.9 (5.2–10.6)	General exercise[2]	662 (21.9)	3.2 (2.4–4.0)
2	Football	375 (11.8)	9.0 (6.1–11.9)	General exercise[2]	324 (13.5)	7.5 (4.5–10.5)	Recreational sport[3]	362 (12.00)	1.7 (1.1–2.3)
3	Playground	309 (9.7)	7.4 (4.9–10.0)	Soccer	257 (10.7)	6.0 (3.6–8.3)	Basketball	264 (8.8)	1.3 (0.8–1.8)
4	Gymnastics/ cheerleading	302 (9.5)	7.3 (4.7–9.9)	Football	243 (10.1)	5.6 (3.1–8.2)	Pedal cycling	222 (7.4)	1.1 (0.6–1.5)
5	Pedal cycling	257 (8.1)	6.2 (3.8–8.6)	Gymnastics/ cheerleading	145 (6.0)	3.4 (1.2–5.3)	Water sport	213 (7.1)	1.0 (0.6–1.5)
…	Total	3,179 (100.0)	76.6 (68.4–84.8)	Total	2,400 (100.0)	55.6 (17.9–63.4)	Total	3,019 (100.0)	14.6 (12.8–16.3)

… Category not applicable.

[1]Rates are per 1,000 persons with 95% confidence interval (CI).

[2]Includes aerobics, exercising, weight training, running, and nonspecific school-related sports- and recreation-related activities.

[3]Includes tennis, racquetball, badminton, and other racquet sports, as well as golf, bowling, fishing, hunting, hiking, mountain climbing, and other leisure sports.

SOURCE: NCHS, National Health Interview Survey, 2011–2014.

Table 4. Estimated annual number and percentage of sports- and recreation-related injury episodes, by external cause of injury, nature of injury, and body region: United States, 2011–2014

Injury characterisitic	Number, in thousands	Percent (SE)
External cause of injury		
Fall	2,403	[1]27.9 (1.6)
Overexertion	1,449	16.8 (1.4)
Struck by or against	1,321	15.4 (1.3)
Transportation	1,054	12.3 (1.1)
Cut or pierce	1422	[2]1.7 (0.6)
Other	2,230	25.9 (1.6)
Total	8,599	100.0 …
Nature of injury[3]		
Sprains/strains	4,262	[4]41.4 (1.7)
Fractures	2,055	20.0 (1.4)
Superficial/contusions	1,953	19.0 (1.4)
Open wound	1,044	10.1 (1.0)
Traumatic brain injury	460	4.5 (0.7)
Dislocation	296	2.9 (0.5)
Other	228	2.2 (0.5)
Total	10,298	100.0 …
Body region[3]		
Lower extremity	4,326	[4]42.0 (1.6)
Upper extremity	3,122	30.3 (1.5)
Head & Neck	1,691	16.4 (1.4)
Trunk	1,037	10.1 (1.0)
Other	123	1.2 (0.3)
Total	10,299	100.0 …

. . . Category not applicable.

[1]Indicates highest percentage ($p < 0.05$) among external cause-of-injury categories, except for "Other" external cause.

[2]Estimates may be unstable because they are based on fewer than 20 cases or have a relative standard error of 30% or more.

[3]Up to eight ICD–9–CM codes were assigned to each injury episode. Diagnosis codes were categorized by body region and nature of injury according to the Barell Injury Diagnosis Matrix, except for traumatic brain injury, where the classification was based on the National Center for Injury Prevention and Control surveillance case definition.

[4]Indicates highest percentage ($p < 0.05$).

NOTE: SE is standard error.

SOURCE: NCHS, National Health Interview Survey, 2011–2014.

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