


Scratch...Descriptive epidemiologic study of billiards-related injuries

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Abstract

The purpose of this descriptive epidemiological study is to identify billiards-related injuries that presented to the United States emergency departments from 2000 to 2020. This is a study using secondary data from emergency departments from 2000 to 2020 and presented with billiards-related injuries. No applicable intervention, but the main outcome measure was a description of injuries sustained due to participation in billiards. Billiards-related injury was captured by the National Electronic Injury Surveillance System – All Injury Program database. We extracted information on age, gender, injury, and disposition. A collective total of 78,524 (n = 1214) estimated patients, had emergency department visits after incurring billiards-related injuries as a sample. The mean age was 24.9 years. Most injuries occurred in males, 54,915 (n = 851, 69.9%). More injuries appeared to be soft-tissue contusions and abrasions, 19,000 (24.2%, n = 280), followed by lacerations, 17,520 (22.3%, n = 269). The most common cause of injury was being struck by a ball or cue, 39,705 (51.1%, n = 643). While the majority of injured patients were discharged home after evaluation, 2527 (3.2%, n = 45) of them required hospitalization. While a small number of billiards-related injuries presented to the emergency department in comparison to other sports-related injuries, some required more intensive treatment or hospitalization.

Abbreviations: NEISS-AIP = National Electronic Injury Surveillance System—All Injury Program.

Keywords: athletic injuries/complications, billiards, injuries, recreation

1. Introduction

Billiards is a popular activity in Western culture. Approximately 34.6 million individuals, age 6 years or older, play billiards in the United States (US).^[1] Billiards is played casually and competitively at home, at local gaming facilities, or a bar. Billiards can be played by 2 to 4 players, with the object of the game to use a long cue stick to get the billiards balls into the pocket and score points. Billiards-related injuries occur, most frequently abrasions and lacerations after being struck with the cue.^[2] While rare, traumatic injuries from pool cues can lead to serious consequences, including penetrating orbital trauma,^[3] psychosis after craniocerebral injury,^[4] facial infection,^[5] perforation of the hypopharynx,^[6] and even optic nerve avulsion.^[7] Much of the published literature on billiards consists of case reports, a large-scale study of billiards injuries does not exist. This study reports billiards injuries treated at United States emergency departments.

2. Methods

This study was an analysis of secondary data; did not involve patients or the public in the design, conduct, reporting, or

dissemination. The study was reviewed by the Institutional Review Board of the University of Texas Medical Branch (FWA#: 00002729) and did not meet the definition of “human subjects research” and therefore did not require IRB approval or oversight. All injuries related to the sport of billiards for the years 2000 to 2020 were extracted from the United States Consumer Product Safety Commission’s National Electronic Injury Surveillance System—All Injury Program database.^[8–29] This database collects information from a stratified probability sample of approximately 100 emergency departments from among the more than 5300 hospital emergency departments providing 24-hour case with at least 6 beds in the United States and its territories.^[8] All major categories of external cause of injury (e.g., transportation or sports) and intent of injury (e.g., assault or self-harm) were captured by the National Electronic Injury Surveillance System – All Injury Program (NEISS-AIP) database. Inclusion criteria involved all billiards-related injuries under the “sports” theme that presented with the only exclusions involving cleaning injuries of the hall or table.^[8,30,31] We extracted and summarized information on age, gender, body part injured, diagnosis, type of injury, and disposition. Counts, national estimates, and confidence intervals were calculated. Data was analyzed using

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The datasets generated during and/or analyzed during the current study are publicly available.

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Table 1
Distribution of billiards-related injuries treated in US emergency departments 2000–2020.

	Freq	Wgt Freq	LCL Wgt Freq	UCL Wgt Freq	%	LCL	UCL	Row%	Row LCL	Row UCL	Col%	Col LCL	Col UCL
Sex													
Total	1214	78,524	62,447	94,601	0.014	0.012	0.016	100.000	67.180	72.687	0.018	0.015	0.021
Male	851	54,915	43,483	66,346	0.010	0.008	0.011	69.933	27.313	32.820	0.009	0.007	0.011
Female	363	23,609	18,297	28,921	0.004	0.003	0.005	30.067					
Body region injured													
Total	1214	78,524	62,447	94,601	0.014	0.012	0.016	100.000					
Head/Neck	468	28,734	22,538	34,929	0.005	0.004	0.006	36.592	32.441	40.744	0.015	0.016	0.022
Arm/Hand	320	19,887	15,461	24,313	0.004	0.003	0.004	25.326	22.163	28.490	0.019	0.012	0.017
Leg/Foot	162	10,420	7,497	13,343	0.002	0.001	0.002	13.270	11.127	15.412	0.009	0.007	0.011
L Trunk	146	10,486	7,307	13,666	0.002	0.001	0.002	13.354	10.329	16.380	0.020	0.015	0.025
U Trunk	100	7,666	4,659	10,673	0.001	0.001	0.002	9.763	7.292	12.233	0.015	0.010	0.021
Other*	18	1,330	530	2,131	0.000	0.000	0.000	1.694	0.661	2.728	0.003	0.001	0.004
Type of injury													
Total	1214	78,524	62,447	94,601	0.014	0.012	0.016	100.000					
Contusion/Abrasion	280	19,000	14,767	23,233	0.003	0.003	0.004	24.196	21.077	27.315	0.019	0.016	0.022
Laceration	269	17,520	13,936	21,104	0.003	0.002	0.004	22.311	19.027	25.595	0.020	0.016	0.024
Strain/Sprain	209	15,497	11,042	19,952	0.003	0.002	0.003	19.735	15.333	24.138	0.013	0.010	0.016
Fracture	164	9,418	6,258	12,579	0.002	0.001	0.002	11.994	9.406	14.582	0.013	0.009	0.017
Internal Injury	90	4,823	2,704	6,941	0.001	0.001	0.001	6.142	3.976	8.307	0.014	0.010	0.019
Other	57	3,774	892	6,656	0.001	0.000	0.001	4.806	1.683	7.929	0.010	0.004	0.015
Type of injury*													
Dental Injury	25	747	248	1,246	0.000	0.000	0.000	0.952	0.304	1.599	0.043	0.017	0.068
Dislocation	19*	1,198	500	1,897	0.000	0.000	0.000	1.526	0.640	2.412	0.014	0.006	0.022
Foreign Body*	19*	1,232	521	1,943	0.000	0.000	0.000	1.569	0.731	2.407	0.010	0.004	0.015
Hematoma*	11*	781	270	1,291	0.000	0.000	0.000	0.994	0.383	1.605	0.019	0.008	0.031
Poisoning*	10*	770	92	1,448	0.000	0.000	0.000	0.981	0.125	1.836	0.002	0.000	0.003
Avulsion*	8*	647	156	1,139	0.000	0.000	0.000	0.824	0.189	1.460	0.019	0.004	0.034
Nerve Damage*	7*	484	77	892	0.000	0.000	0.000	0.617	0.078	1.155	0.023	0.002	0.043
Crushing*	5*	102	0	247	0.000	0.000	0.000	0.130	0.000	0.315	0.006	0.000	0.014
Puncture*	5*	401	0	821	0.000	0.000	0.000	0.510	0.000	1.065	0.004	0.000	0.008
Hemorrhage*	5*	262	0	579	0.000	0.000	0.000	0.333	0.000	0.741	0.033	0.000	0.073
Ingestion*	2*	107	0	281	0.000	0.000	0.000	0.136	0.000	0.358	0.004	0.000	0.010
Anoxia*	2*	57	0	171	0.000	0.000	0.000	0.072	0.000	0.216	0.005	0.000	0.014
Aspiration*	1*	24	0	72	0.000	0.000	0.000	0.031	0.000	0.093	0.001	0.000	0.004
Electric Shock*	1*	120	0	360	0.000	0.000	0.000	0.153	0.000	0.453	0.045	0.000	0.137
Disposition													
Total	1213	78,515	62,437	94,592	0.014	0.012	0.016	100.000					
Treated/Released	1141	74,180	58,759	89,600	0.013	0.011	0.015	94.479	92.112	96.846	0.015	0.012	0.017
Hospitalized	45	2,527	1,110	3,944	0.000	0.000	0.001	3.219	1.515	4.922	0.007	0.003	0.010
AMA/LWBS*	16*	756	182	1,330	0.000	0.000	0.000	0.963	0.219	1.706	0.012	0.002	0.021
Disposition													
Transferred/Released*	8*	936	200	1,672	0.000	0.000	0.000	1.192	0.276	2.108	0.013	0.003	0.024
Observation*	3*	116	0	289	0.000	0.000	0.000	0.148	0.000	0.351	0.003	0.000	0.007

(Continued)

Table 1
(Continued)

	Freq	Wgt Freq	LCL Wgt Freq	UCL Wgt Freq	%	LCL	UCL	Row%	Row LCL	Row UCL	Col%	Col LCL	Col UCL
Month of injury													
January	117	8223	5909	10,536	0.001	0.001	0.002	10.471	8.288	12,655	0.020	0.014	0.025
February	94	6158	4399	7917	0.001	0.001	0.001	7.842	6.053	9,631	0.016	0.013	0.019
March	91	5402	3060	7745	0.001	0.001	0.001	6.880	4.203	9,557	0.012	0.008	0.017
April	84	5417	3806	7027	0.001	0.001	0.001	6.898	4.945	8,852	0.012	0.009	0.016
May	70	4414	3107	5722	0.001	0.001	0.001	5.621	4.498	6,745	0.009	0.006	0.011
June	92	5965	4060	7869	0.001	0.001	0.001	7.596	5.700	9,493	0.012	0.008	0.016
July	121	7723	5541	9904	0.001	0.001	0.002	9.835	8.039	11,631	0.014	0.011	0.018
August	86	5577	4016	7138	0.001	0.001	0.001	7.102	5.390	8,814	0.010	0.008	0.013
September	89	6086	4260	7913	0.001	0.001	0.001	7.751	6.250	9,252	0.012	0.008	0.015
October	111	7097	4559	9635	0.001	0.001	0.002	9.038	6.655	11,421	0.014	0.010	0.019
November	133	9126	5970	12,282	0.002	0.001	0.002	11.622	9.107	14,137	0.021	0.014	0.027
December	126	7337	5190	9,484	0.001	0.001	0.002	9.343	7.241	11,446	0.017	0.012	0.022
Total	1214	78,524	62,447	94,601	0.014	0.012	0.016	100.000	-	-	-	-	-
Day of the week of injury													
Sunday	213	13,320	10,340	16,300	0.002	0.002	0.003	16.963	14.720	19,206	0.016	0.013	0.019
Monday	182	10,699	7526	13,873	0.002	0.001	0.002	13.626	11.237	16,015	0.013	0.009	0.016
Tuesday	144	9606	7259	11,954	0.002	0.001	0.002	12.233	9.810	14,657	0.012	0.009	0.015
Day of the week of injury													
Wednesday	127	7811	5346	10,276	0.001	0.001	0.002	9.947	7.905	11,988	0.010	0.007	0.013
Thursday	151	10,037	7271	12,804	0.002	0.001	0.002	12.782	10.579	14,986	0.013	0.010	0.016
Friday	168	12,045	9211	14,879	0.002	0.002	0.003	15.340	13.153	17,526	0.015	0.012	0.018
Saturday	229	15,006	11,286	18,725	0.003	0.002	0.003	19.110	16.855	21,364	0.018	0.014	0.021
Total	1214	78,524	62,447	94,601	0.014	0.012	0.016	100.000	-	-	-	-	-
Precipitating cause of injury													
Total	1198	77,666	61,944	93,388	0.014	0.012	0.016	100.000	48.024	54,222	0.046	0.040	0.053
Struck by/Ag	643	39,705	31,691	47,719	0.007	0.006	0.008	51.123	19.553	25,663	0.010	0.008	0.012
Fall	291	17,559	12,964	22,154	0.003	0.003	0.004	22.608	16.405	23,972	0.025	0.019	0.031
Overexertion	198	15,679	11,247	20,112	0.003	0.002	0.004	20.188	2.267	5,786	0.007	0.004	0.011
Cut/pierce	40	3127	1652	4602	0.001	0.000	0.001	4.027	0.093	1,216	0.004	0.001	0.008
Foreign body*	10*	508	77	940	0.000	0.000	0.000	0.655	0.061	1,709	0.002	0.000	0.005
Other Specified*	8*	687	13	1362	0.000	0.000	0.000	0.885	0.000	0.601	0.001	0.000	0.002
Poisoning*	4*	223	0	452	0.000	0.000	0.000	0.287	0.000	0.218	0.001	0.000	0.002
Fire/burn*	2*	57	0	171	0.000	0.000	0.000	0.073	0.000	0.094	0.001	0.000	0.002
MV occupant*	1*	24	0	73	0.000	0.000	0.000	0.031	0.000	0.094	0.000	0.000	0.002
Natural/ environmental*	1*	95	0	286	0.000	0.000	0.000	0.123	0.000	0.368	0.008	0.000	0.026

No observations found for categories: "Burns, Electrical," "Burns, Not specified," "Burns, Scald," "Burns, Chemical," "Amputation," "Burns, Thermal," "Submersion," "UNK/NS," "Motorcyclist," "Pedal cyclist," "Pedestrian," "Oth transport," "Inhaln/suff," "Drown/near drown," "Machinery," "Dog bite," "Oth bit/stng," "Firearm gunshot," "BB/pellet gunshot," "Adv eff sur/med care."

*Consumer Product Safety Commission considers an estimate unstable and potentially unreliable when the number of records used is <20 or the estimate is <1200.

sampling weights to account for selection probabilities, oversampling, non-response, and differences between the sample and the total US population. Chi-Square tests were run to compare sprains to fractures in all body parts. It must be noted that categories with number of records lower than 20 or national estimates lower than 1200 are considered unstable and potentially unreliable by the Consumer Product Safety Commission.

3. Results

National estimates are presented with their sample size in between parenthesis, percentage is also added where it was appropriate. From 2000 to 2020, 78,524 estimated billiards-related injuries (n = 1214) presented to a sample of US emergency departments (Table 1). The number of injuries ranged from a high of 5970 (n = 91) in 2002 to a low of 2323 (n = 33) in 2016. Males were primarily impacted 54,915 (n = 851) 69.9%, compared to females 23,609 (n = 363) 30.1%. More injuries occurred on the weekends (Saturday or Sunday) 28,326 (n = 442, 36.1%,). More injuries also happened in the fall/winter months (October to February) 37,940 (n = 581, 48.3%).

Largely, the injuries appeared to be secondary to trauma. More injuries appeared to be soft-tissue contusions and abrasions 19,000 (n = 280, 24.2%), followed by lacerations 17,520 (n = 269, 22.3%). Of note, there were also 15,497 (n = 209, 19.7%) sprain/strains and 9418 (n = 164, 12.0%) fractures following billiards-related injuries. When further stratifying sprain/strain by body part injuries, 7506 (n = 96, 45.9%) impacted the lower trunk. Fractures often impacted the arm/hand 3955 (n = 79, 48.2%).

The most common injury mechanism was being struck 39,705 (n = 643, 51.2%), but of interest, there were poisonings 92 (n = 10) and cut/pierce type injuries 3127 (n = 40, 2.3%), which most likely were due to puncture or laceration from pool cues. Most patients were treated and released, an estimate of 74,180 (n = 1141, 94.5%,), but 2643 (n = 48, 3.4%) required observation or hospitalization.

The top 5 diagnoses for billiard-related injuries are contusion/abrasion, laceration, sprain/strain, fracture, and internal injury. We examined more specifically strain/sprain and fracture to better identify which body part was injured. We found that head/neck, arm/hand, and leg/foot were more likely to be damaged with fracture (n = 624, 72.2%; n = 3955, 69.9%; and n = 3073, 55.7%) while upper trunk and lower trunk were more likely to be strained/sprained (n = 2732, 68.6%; and n = 7506, 93.2%) (Table 2). The difference is significant ($P < .05$).

4. Discussion

Our research is the first to report billiards-related injuries from a representative sample across the United States. While

most injuries are minor, including contusions and abrasions (n = 19,000), a fair number are more serious, even requiring hospitalization (n = 2527). Our results show several strain/sprains (n = 15,497) and fracture (n = 9418). With strains and sprains, primarily impacting the lower trunk (n = 7506) and fractures primarily impacting the arm/hand (n = 3955). Reviewing billiards playing guidelines as set by the World Pool-Billiards Association, the rules focus on the technique of the game, rather than decreasing injury risk.^[32] The external validity of this study can be applied to the United States as this was pulled from its national database, can be used to extrapolate trends from year to year, and may be used as a baseline when evaluating emergency department presentation for billiards-related injuries. When referencing safety guidelines of the sport, standardized cautions and warnings can be placed in pool halls, clubs, or bars, particularly when an inebriated state is expected in some or all players. In addition, excessive horseplay and rowdiness can be monitored more closely to prevent fractures, lacerations, and contusions: the most common injuries seen in the sport of billiards presenting to the emergency department. In conjunction with continued national surveillance, the added awareness of the risks of a seemingly benign game may reduce injury risk at the population level and streamline emergency care.

Limitations of this study include that only injuries that presented to the emergency department are analyzed, so many minor injuries in the dataset may not be captured as they may have presented to a non-emergency department setting. This may lead to an underestimate of the actual number of injuries. In addition, it is difficult to assess the severity of injuries that warranted admission from the emergency department as case narratives were not reviewed. The true incidence of injury also remains underestimated given that NEISS-AIP is a sample of 100 U.S. hospitals.^[7] Another limitation is that the data collected includes interaction with a billiards related product, not necessarily a true billiards related injury. Without reviewing the case narrative data, it is difficult to identify the true incidence of billiards-related injuries. Nonetheless, this report belies the notion that billiards is a safe sport without chance of serious injury, but further research is indicated about injury specific rates in billiards players who are participating in sporting events.

This investigation suggests that injuries related to billiards are quite varied, and while mostly not requiring inpatient hospitalizations, may sometimes result in serious injury requiring admission. Physicians should consider counseling billiards players about the risks of the sport and be prepared to handle a spectrum of injuries. Future research may be directed to better identifying injuries which are related to the sport of playing billiards. With better identification of billiards sports related injuries, billiards organizations may be better able to identify rule changes to help potentially mitigate the impact of these injuries.

Table 2

Body part and diagnosis among billiard-related injuries treated in hospital emergency departments.

	Total (n = 373)		Strain/sprain (n = 209)			Fracture (n = 164)		
	Unweighted N (Weighted %)	Unweighted N	National estimate	Weighed %	Unweighted N	National estimate	Weighed %	
Head/neck	18 (100)	5*	245	27.8	13*	624	72.2	
Upper trunk	51 (100)	35	2732	68.6	16*	1517	31.4	
Lower trunk	103 (100)	96	7506	93.2	7*	249	6.8	
Arm/hand	113 (100)	34	2676	30.1	79	3955	69.9	
Leg/foot	88 (100)	39	2337	44.3	49	3073	55.7	

The association between body part and diagnosis is statistically significant ($P < .05$).

*Consumer Product Safety Commission considers an estimate unstable and potentially unreliable when the number of records used is < 20 or the estimate is < 1200.

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References

- [1] 2021 S. Number of participants in billiards/pool in the United States from 2006 to 2013 (in millions). 2021. Available at: <https://www.statista.com/statistics/191809/participants-in-billiards-in-the-us-since-2006/> [access date March 7, 2021].
- [2] Kuch M. 15 Common Billiards injuries (Prevention & Treatment). Sun Media Brands. Updated July 6, 2023. 2024. Available at: <https://sports-foundation.org/common-billiards-injuries/> [access date January 21, 2024].
- [3] Kirkby GR. Penetrating orbitocranial injury with a snooker cue. *BMJ*. 1986;293:1646.
- [4] Turkalj I, Stojanovic S, Petrovic K, et al. Psychosis following stab brain injury by a billiard stick. *Hippokratia*. 2012;16:275–7.
- [5] Cameron M, Phillips B. Snookered! Facial infection secondary to occult foreign body. *Int J Oral Maxillofac Surg*. 2006;35:373–5.
- [6] Martin-Ucar AE, Yates DR, Vaughan R. A new traumatic agent: snooker cue causing perforation of the hypopharynx – case report. *J Trauma*. 2003;55:992–3.
- [7] Hykin PG, Gardner ID, Wheatcroft SM. Optic nerve avulsion due to forced rotation of the globe by a snooker cue. *Br J Ophthalmol*. 1990;74:499–501.
- [8] Schroeder T, Ault K. The NEISS Sample (Design and Implementation) 1997 to Present. Division of Hazard and Injury Data Systems, U.S. Consumer Product Safety Commission. Available at: https://www.cpsc.gov/s3fs-public/January-2021-NT-CPSC-only-NEISS-Coding-Manual.pdf?xa_nMM1kB4SGpuSMOwf0NHkkkIqNcn8F [access date February 4, 2021].
- [9] Health USDo, Control HSCfD, Prevention PNCfI, Control, Commission USCPS. Data from: National Electronic Injury Surveillance System All Injury Program, 2000. 2005. doi:10.3886/ICPSR03582.v1.
- [10] Health USDo, Control HSCfD, Prevention PNCfI, Control, Commission USCPS. Data from: National Electronic Injury Surveillance System All Injury Program, 2001. 2003. doi:10.3886/ICPSR03817.v1.
- [11] Health USDo, Control HSCfD, Prevention PNCfI, Control, Commission USCPS. Data from: National Electronic Injury Surveillance System All Injury Program, 2002. 2004. doi:10.3886/ICPSR04085.v1.
- [12] Health USDo, Control HSCfD, Prevention PNCfI, Control, Commission USCPS. Data from: National Electronic Injury Surveillance System All Injury Program, 2003. 2005. doi:10.3886/ICPSR04352.v1.
- [13] Health USDo, Control HSCfD, Prevention PNCfI, Control, Commission USCPS. Data from: National Electronic Injury Surveillance System All Injury Program, 2004. 2006. doi:10.3886/ICPSR04598.v1.
- [14] Health USDo, Control HSCfD, Prevention PNCfI, Control, Commission USCPS. Data from: National Electronic Injury Surveillance System All Injury Program, 2005. 2007. doi:10.3886/ICPSR21280.v1.
- [15] Health USDo, Control HSCfD, Prevention PNCfI, Control, Commission USCPS. Data from: National Electronic Injury Surveillance System All Injury Program, 2006. 2009. doi:10.3886/ICPSR24421.v1.
- [16] Health USDo, Control HSCfD, Prevention PNCfI, Control, Commission USCPS. Data from: National Electronic Injury Surveillance System All Injury Program, 2007. 2010. doi:10.3886/ICPSR26941.v1.
- [17] Health USDo, Control HSCfD, Prevention PNCfI, Control, Commission USCPS. Data from: National Electronic Injury Surveillance System All Injury Program, 2008. 2011. doi:10.3886/ICPSR30544.v1.
- [18] Health USDo, Control HSCfD, Prevention PNCfI, Control, Commission USCPS. Data from: National Electronic Injury Surveillance System All Injury Program, 2009. 2013. doi:10.3886/ICPSR33681.v1.
- [19] Health USDo, Control HSCfD, Prevention PNCfI, Control, Commission USCPS. Data from: National Electronic Injury Surveillance System All Injury Program, 2010. 2013. doi:10.3886/ICPSR34640.v2.
- [20] Health USDo, Control HSCfD, Prevention PNCfI, Control, Commission USCPS. Data from: National Electronic Injury Surveillance System All Injury Program, 2011. 2014. doi:10.3886/ICPSR35233.v1.
- [21] Health USDo, Control HSCfD, Prevention PNCfI, Control, Commission USCPS. Data from: National Electronic Injury Surveillance System All Injury Program, 2012. 2015. doi:10.3886/ICPSR36280.v1.
- [22] Health USDo, Control HSCfD, Prevention PNCfI, Control, Commission USCPS. Data from: National Electronic Injury Surveillance System All Injury Program, 2013. 2017. doi:10.3886/ICPSR36693.v1.
- [23] Health USDo, Control HSCfD, Prevention PNCfI, Control, Commission USCPS. Data from: National Electronic Injury Surveillance System - All Injury Program, [United States], 2014. 2018. doi:10.3886/ICPSR37100.v1.
- [24] Health USDo, Control HSCfD, Prevention PNCfI, Control, Commission USCPS. Data from: National Electronic Injury Surveillance System All Injury Program, 2015. 2019. doi:10.3886/ICPSR37274.v1.
- [25] Health USDo, Control HSCfD, Prevention PNCfI, Control, Commission USCPS. Data from: National Electronic Injury Surveillance System All Injury Program, 2016. 2020. doi:10.3886/ICPSR37667.v1.
- [26] Health USDo, Control HSCfD, Prevention PNCfI, Control, Commission USCPS. Data from: National Electronic Injury Surveillance System All Injury Program, 2017. 2021. doi:10.3886/ICPSR38085.v1.
- [27] Health USDo, Control HSCfD, Prevention PNCfI, Control, Commission USCPS. Data from: National Electronic Injury Surveillance System All Injury Program, 2018. 2021. doi:10.3886/ICPSR38257.v1.
- [28] Health USDo, Control HSCfD, Prevention PNCfI, Control, Commission USCPS. Data from: National Electronic Injury Surveillance System All Injury Program, 2019. 2021. doi:10.3886/ICPSR38289.v1.
- [29] Health USDo, Control HSCfD, Prevention PNCfI, Control, Commission USCPS. Data from: National Electronic Injury Surveillance System All Injury Program, 2020. 2022. doi:10.3886/ICPSR38571.v1.
- [30] Khodae M, Kirk K, Pierpoint LA, et al. Epidemiology of lacrosse injuries treated at the United States emergency departments between 1997 and 2015. *Res Sports Med*. 2020;28:426–36.
- [31] System NEIS. NEISS Coding Manual – January 2019. 2021. Available at: https://www.cpsc.gov/s3fs-public/2019_NEISS_Coding_Manual.pdf [access date February 4, 2021].
- [32] Association WP-B. Pool Billiards – The Rules of Play. 2024. Available at: <https://wpbsa.com/wp-content/uploads/Rulebook-Website-Updated-May-2022-2.pdf> [access date January 21, 2024].