**Supplemental Digital Content 2.** Quality assessment results of included studies using the Newcastle-Ottawa Scale

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| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| Study | Selectiona | | | | | | Comparabilityb | Outcomec | | | | Quality assessment |
|  | A | B | C | D |  |  |  | A | B | C | D |  |
| Agel and Harvey [1] | 1 | 0 | 1 | 0 |  |  | 1 | 1 | 1 | 0 | 0 | Fair |
| Comstock et al. [8] | 1 | 0 | 1 | 0 |  |  | 2 | 1 | 1 | 1 | 0 | Fair |
| Gessel et al. [16] | 1 | 0 | 1 | 0 |  |  | 2 | 1 | 1 | 1 | 0 | Fair |
| Lincoln et al. [22] | 1 | 0 | 1 | 0 |  |  | 1 | 1 | 1 | 1 | 0 | Fair |
| Marar et al. [24] | 1 | 0 | 1 | 0 |  |  | 2 | 1 | 1 | 1 | 0 | Fair |
| O’Connor et al. [27] | 1 | 0 | 1 | 0 |  |  | 1 | 1 | 1 | 1 | 0 | Fair |
| Rosene et al. [28] | 1 | 0 | 1 | 0 |  |  | 2 | 1 | 1 | 1 | 0 | Fair |
| Simmons et al. [30] | 1 | 0 | 1 | 0 |  |  | 1 | 1 | 1 | 0 | 0 | Fair |
| Xiang et al. [36] | 1 | 0 | 1 | 0 |  |  | 1 | 1 | 1 | 1 | 0 | Fair |
| Zuckerman et al. [37] | 1 | 0 | 1 | 0 |  |  | 1 | 1 | 1 | 0 | 0 | Fair |

aSelection criteria - (A) representativeness of the exposed cohort (athletes), 1: truly representative of the average youth, high school, collegiate, or adult athlete in the community; 0: not representative of the average athlete in the community or no description of the derivation of the cohort; (B) selection of the non-exposed cohort, 1: drawn from the same community as the athlete cohort; 0: drawn from a different source than the athlete cohort or no description of the derivation of the non-exposed cohort; (C) ascertainment of exposure, 1: secure record of concussion incident or structured interview; 0: written self-report or no description; (D) demonstration that outcome of interest (concussion incidence) was not present at start of study, 1: yes, 0: no.

bComparability between males and females on the basis of the design or analysis: 1, study includes concussion incidence for males and females in a specific sport; 2, study includes concussion incidence for males and females in a specific sport as well as other factors, such as age or skill level; 0, study does not include concussion incidence for males and females.

cOutcome criteria - (A) assessment of outcome: 1: independent blind assessment or blind linkage; 0: self-report or no description; (B) was follow-up long enough for outcomes to occur: 1: yes, 0: no; (C) adequacy of follow-up of cohorts: 1: complete follow-up of all subjects or subjects lost to follow-up were unlikely to introduce bias; 0: follow-up rate not adequate or no statement; and (D) statistical test: 1: the statistical test used to analyze data is clearly described and appropriate, and the measurement of the association is presented, including confidence intervals and p values; 0: the statistical test is not appropriate, not described, or incomplete.