The Risk of Nonmedical Opioid Use in High School Athletes: A Critically Appraised Topic
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Background:
Nonmedical prescription opioid use (NMPOU) use has taken an unprecedented rise in the United States. This rise has lead to roughly 90 deaths per day from opioid overdose, equaling, if not surpassing, the number of US citizens who die from car accidents per day\(^1\). The executive branch has declared this epidemic a public health emergency. This epidemic has occurred across all boundaries of society, and it is not particular to one race, class, or geographic region. It is therefore crucial to determine risk factors for NMPOU in an effort to prevent more opioid overdose deaths. Athlete NMPOU has received a large amount of press coverage, but it has not been determined if athletic participation is a risk factor for NMPOU\(^2,3\). A specific population within athletics that particularly deserves attention is high school athletes. This is first due to the fact that high school athletes may have less access to health care than collegiate and professional athletes, and second, because these young adults may be living in societies where NMPOU has become normalized. Athletic trainers are in a unique position to have a high impact on this epidemic and therefore must be aware of the prevalence of opioid misuse and abuse in high school athletes. The question must be asked if high school athletes are more or less at risk to be included in this epidemic than non-athletes in high school.

Methods:
A critical appraisal and summary of the literature was performed to quantify the risk of NMPOU in interscholastic athletes. The specific question developed was: In high school students, does interscholastic sports participation increase the risk of nonmedical prescription opioid use (NMPOU)? PubMed was searched through September 2017 for articles that answered this specific question. Search terms included iterations of “opioid”, “abuse”, “sport”, “high school”, and “athletics”. Studies were limited to those published within the past 5 years and written in English. Selection criteria required that studies investigated 1) high school students, 2) athletes and non-athletes, and 3) reported epidemiological data regarding the self-reported misuse or abuse of prescription opioids. Fifteen studies were initially identified, and three were selected for analysis. The modified Downs and Black Checklist appraised the three studies selected for internal validity. Extracted data from the three studies was collected via large-scale survey; odds ratios [with 99% CIs] were calculated for event and frequency data. Individual odds ratios were pooled into a summary model to determine the effect of sports participation on prescription opioid use.

Results:
Data synthesis showed a slightly protective effect for frequent sports participation, meaning that high school students who participated in interscholastic sports were less at risk for NMPOU than high school students who did not participate in athletics (Figure 1). On closer inspection of the data, 2 studies demonstrated deleterious effects of sports on NMPOU (summary OR = 1.5\([0.7, 3.1]\), \(p=0.13\)), while the 3rd demonstrated a protective effect of sports on use (OR = 0.3\([0.3, 0.3]\), \(p<0.001\)).
Conclusions:
There was inconclusive evidence for the risk of NMPOU associated with sports participation in high school athletics. In 2 studies, there was about a 50% increase of NMPOU in athletes compared to non-athletes. However, the third study indicated about 70% protective effect of sports participation on NMPOU. Although, it could not be quantitatively assessed, a closer inspection of one study revealed a considerable increase of NMPOU in football and wrestling, and a neutral or protective effect for other sports (Table 1). This discrepancy in NMPOU based on sex and/or sport, may have nullified the effect in the summary analyses. Whether this was an effect of sex or of the high contact/collision nature of the sport (an increased risk of serious injury may result in more access to prescription narcotics), could not be discerned. Regardless, ATs working with football or wrestling athletes should consider closely monitoring both narcotic prescription acquisition following moderate or severe injury, and potential signs of NMPOU. The high risk of addiction warrants future research on both prevalence and prevention of NMPOU in interscholastic sports.

Word Count: 689

Figure 1. Odds ratios and confidence intervals of articles analyzed.

![Odds ratios and confidence intervals of articles analyzed.](image)

Table 1. Adjusted odds ratios for highest risk and lowest risk sports. Values greater than 1 indicate an increase risk; values less than one indicate a protective effect.

<table>
<thead>
<tr>
<th>Sport</th>
<th>Adjusted Odds Ratio</th>
</tr>
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<tbody>
<tr>
<td>Football</td>
<td>1.5</td>
</tr>
<tr>
<td>Wrestling</td>
<td>1.5</td>
</tr>
<tr>
<td>Crew</td>
<td>0.7</td>
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<tr>
<td>Cross Country</td>
<td>0.5</td>
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Works Cited:


