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Nonmedical Use of Prescription Opioids and Heroin Use Among Adolescents Involved in Competitive Sports

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A B S T R A C T

Purpose: Examine the past-year prevalence of nonmedical use of prescription opioids (NUPOs), heroin use, and the concurrent NUPO and heroin in a sample of 12th graders involved in 16 different sports.

Methods: A secondary analysis of nationally representative data from nine cohorts (2006–2014) of the Monitoring the Future study (n = 21,557).

Results: No differences were found between 12th graders who participated in at least one competitive sport and nonparticipants with respect to past-year NUPO, heroin use, and concurrent NUPO and heroin use. Most of the 16 sports analyzed were not associated with the three drug use outcomes. However, 12th graders who participated in ice hockey had substantially greater odds of both past-year heroin use and concurrent NUPO and heroin, while those who participated in weightlifting (NUPO and heroin) and wrestling (NUPO) had slightly higher odds of using these drugs.

Conclusions: The study provides critical information to inform physicians, parents, and school officials of the risks associated with participating in certain high contact sports, particularly ice hockey.

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**IMPLICATIONS AND
 CONTRIBUTION**

While the majority of sports adolescents participate in during high school are not associated with heroin use and/or nonmedical use of prescription opioids, certain high contact sports like ice hockey increase the risk for concurrent heroin use and nonmedical use of prescription opioid among participants.

Recent research shows that youth athletes in high contact sports (i.e., wrestling and football) are at greater risk to engage in nonmedical use of prescription opioids (NUPO) [1,2]. While it is speculated that injury may be a key force driving this association [2,3], normative behaviors among some athletes or the stress

associated with high-level competition may also play a role in understanding why these types of athletes are at a greater risk to engage in NUPO [4,5].

NUPO among youth athletes is currently a major public health concern given that prescription opioid misuse is a strong risk factor for heroin use [6,7]. Although it is hard to determine whether NUPO is a significant cause of eventual heroin use [6], it is clear that the majority of heroin users have used opioids in a nonmedical context [8]. Unfortunately, no studies have assessed the potential overlapping use of opioids and heroin among youth athletes, including those involved in different competitive sports [9]. Accordingly, toward the goal of better understanding adolescents' use of prescription opioids and heroin, the objective

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Table 1
Sample characteristics (unweighted n = 21,557/weighted n = 21,611)

	MI ^a		Sample with listwise deletion		
	%	SE	%	SE	% Missing
Control variables					
Male (ref.)	49.4	.004	48.3	.005	4.50
Female	50.6	.004	51.7	.005	
White (ref.)	58.3	.004	63.5	.004	.00
Non-white	41.7	.004	36.5	.004	
Did not cut class (ref.)	69.4	.004	70.2	.004	7.60
Cut class	30.6	.004	29.8	.004	
Has an average grade of B– or higher (ref.)	82.6	.003	84.4	.003	5.30
Has an average grade of C+ or lower	17.4	.003	15.6	.003	
Goes out at most 2 nights a week (ref.)	54.5	.004	54.2	.005	6.60
Goes out 3 or more times a week	45.5	.004	45.8	.005	
Does not have a job (ref.)	36.9	.004	35.9	.004	6.30
Works 1–20 hours a week	42.3	.004	43.8	.005	
Works 21 or more hours a week	20.8	.004	20.3	.004	
Both parents have a BA or higher (ref.)	49.9	.004	47.7	.005	3.50
At least one parent has a BA	50.1	.004	52.3	.005	
Respondent lives in a non-MSA (ref.)	21.1	.003	22.2	.004	.00
Respondent lives in an MSA	48.6	.004	49.1	.005	
Respondent lives in a large MSA	30.4	.004	28.7	.004	
Respondent lives in the Northeast (ref.)	18.5	.003	16.4	.003	.00
Respondent lives in the Midwest	23.5	.003	25.5	.004	
Respondent lives in the South	36.0	.004	35.6	.004	
Respondent lives in the West	22.0	.003	22.4	.004	
Cohort years (2006–2008) (ref.)	34.5	.004	34.5	.004	.00
Cohort years (2009–2011)	34.2	.004	33.9	.004	
Cohort years (2012–2014)	31.3	.004	31.6	.004	
No lifetime cigarette use (ref.)	58.2	.004	59.0	.004	2.50
Lifetime cigarette use	41.8	.004	41.0	.004	
No lifetime alcohol use (ref.)	30.1	.004	29.8	.004	4.50
Lifetime alcohol use	69.9	.004	70.2	.004	
No lifetime marijuana use (ref.)	56.3	.004	57.1	.005	3.90
Lifetime marijuana use	43.7	.004	42.9	.005	
Dependent variables					
Past-year NUPO	8.3	.002	8.5	.003	3.70
Past-year heroin use	.9	.001	.7	.001	3.00
Past-year heroin use and NUPO	.6	.001	.6	.001	3.80
Major independent variables^b					
Does not participate in sport	30.7	.004	30.7	.004	
Participates in baseball	14.5	.003	14.6	.003	
Participates in basketball	20.2	.004	19.8	.004	
Participates in cross-country	5.2	.002	5.3	.002	
Participates in field hockey	1.0	.001	1.0	.001	
Participates in football	15.8	.003	15.3	.003	
Participates in gymnastics	2.0	.001	2.0	.001	
Participates in ice hockey	1.8	.001	1.7	.001	
Participates in lacrosse	2.9	.002	2.7	.001	14.40
Participates in swimming	7.5	.002	7.5	.002	
Participates in soccer	12.9	.003	13.0	.003	
Participates in tennis	6.1	.002	6.3	.002	
Participates in track	12.3	.003	12.3	.003	
Participates in volleyball	8.8	.003	8.8	.003	
Participates in weightlifting	12.4	.003	12.3	.003	
Participates in wrestling	4.4	.002	4.1	.002	
Participates in other sport	26.0	.004	26.6	.004	

% = percent; MI = multiple imputation; MSA = metropolitan statistical area; Ref. = reference group in the multiple logistic regression analysis; SE = standard error.
^a Sequential regression imputation was used to impute missing values on all the variables used in the analyses; several separate imputations with the full MTF sample used chained multinomial, logistic, and ordered logit models in Stata's "mi impute chained" procedure (10 imputations, 5 burn-in iterations each; "augment" option was used in the presence of perfect prediction).

^b Roughly 69.3% of respondents participated in at least one competitive sport. The majority of respondents participated in only one sport (30.4%), followed by respondents who participated in three or more sports (21.2%) and two sports only (17.7%).

of this study was to examine the past-year prevalence of NUPO, past-year heroin use, and the concurrent NUPO and heroin use during the past-year across 16 different youth sports, with a specific focus on high contact sports (i.e., football, lacrosse, ice hockey, and wrestling) where serious sport-related injury are more likely.

Methods

Study design

The present study uses nine cross-sections of the Monitoring the Future (MTF) [10] study between 2006 and 2014. MTF has

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