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## Vaping Opioids: Should We Be Worried?

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### Abstract

The use of electronic cigarettes (i.e., e-cigarettes or vapes) has increased substantially among youth and young adults. While research has examined vaping cannabis and tetrahydrocannabinol (THC), little exists related to vaping other drugs, such as opioids, despite the fact that opioids are a leading cause of drug overdoses associated deaths in the U.S. The current study aimed to review the current state of the literature related to vaping opioids given our experience of learning about a youth overdose related to vaping opioids in a public high school in the U.S. while we were engaged in conducting community-based research. Peer-reviewed research publications related to vaping opioids are minimal, although there are several newspaper articles published related to vaping opioids, with most being about youth vaping opioids in school. This is concerning given that media often misconstrue substance use, particularly related to fentanyl, and may provide inaccurate information that perpetuates stigma. Thus, it remains unclear the scope of the issue of vaping opioids. Therefore, we propose a call to action for researchers and public health officials outlining recommendations for increased surveillance, interventions to address vaping-related opioid use, and measures to curb serious adverse consequences of vaping-related opioid use to determine whether this is a rising public health concern and offer mitigation strategies.

### Keywords

Opioids; E-cigarettes; Vaping; Young Adults; Adolescents

Electronic cigarette (i.e., e-cigarette or vape) use in the United States (US) has drastically increased in recent years, particularly among young people. Roughly 6.6 million middle and high school students reported ever using a tobacco product, with 19.4% (5.3 million) of these youth most commonly using e-cigarettes.<sup>1</sup> Among these students who reported using tobacco products, 11.3% of high school students and 2.8% of middle school students reported vaping most commonly.<sup>1</sup> Recent data suggests that vaping often leads to initiation of other tobacco products among tobacco naïve youth.<sup>2</sup> Additionally, vaping cannabis is increasing among adolescents and young adults,<sup>3</sup> with 23.7% of 12<sup>th</sup> graders having a lifetime prevalence of using cannabis in vapes and 3.5% using it almost daily.<sup>4</sup> Research

has also found that young adults are vaping substances such as herbs, and supplements in addition to illicit substances.<sup>5</sup> However, there is little research on vaping other recreational drugs,<sup>6,7</sup> such as heroin and fentanyl. In a sample of adults from the United Kingdom who endorsed vaping, 39.5% of those using vapes had used recreational drugs in their vape.<sup>6</sup> Of those who reported vaping recreational drugs, 26.7% vaped fentanyl and 25.8% vaped heroin.<sup>6</sup> However, there is no available research examining vaping recreational drugs in the US, among adults or youth.

While a co-author was conducting formative research to develop a school-based tobacco control intervention, they learned a student had overdosed the previous day while vaping opioids in the school bathroom. The co-author was informed that the student survived the incident after being administered Narcan by the school nurse. The event was never publicized given that the incident involved a minor, did not result in death and occurred within a rural area, likely within a media desert. As public health researchers, we were curious about the frequency at which vaping opioids may be occurring within the US. Thus, we aimed to summarize the current state of the literature to assess if vaping opioids is a risk to public health and thus encourage surveillance.

We initially searched for peer-reviewed articles related to vaping opioids. PsycInfo and Pubmed were used to search for previous literature assessing e-cigarettes used with substances other than the intended liquids, specifically related to opioids and opiates using seven key terms or phrases: youth, young adults, vaping, e-cigarettes, opioids, heroin, fentanyl. However, results were extremely limited. Thus, we searched for media articles using LexisNexis (electronic news database) and Google using the same key terms to better understand if this behavior was reported in the media. While media portrayals of opioids, particularly fentanyl, are grossly misconstrued and stereotyped, given the lack of peer-reviewed articles we posited that these reports could be the current state of the literature.

Articles were coded by two trained reviewers on six characteristics: substance discussed, incident setting (home, school, city/state/country), age of person using substance, outcome of incident (e.g., overdose, death), and news source (e.g., local, national). Coders met to resolve discrepancies and came to agreement. If agreement could not be reached, a third coder was brought in to resolve discrepancies. Articles were excluded if the focus was related to cannabis, the source was not reporting on a specific incident, or was not from a peer reviewed or news source. Articles covering the same news story were combined into one entry for data analysis purposes.

Ten news articles, two peer-reviewed case studies and a Drug Enforcement Administration bulletin published between 2016 and 2022 were included. Three articles covered the same story and were combined into one entry. One article was updated to say that the initial police report stating that a vape was contaminated with fentanyl was incorrect, and the vape only contained THC, and thus was also excluded for a total of 10 news stories included in the review. Overall, eight of the articles discussed fentanyl use in vapes, one discussed heroin, and one discussed both. In six of the articles, the individuals vaping were school aged, two were adults ages 25 to 36, and two did not describe the age of the users. All but one

of the articles related to school-aged children occurred within their school. The remaining article described increasing reports of poison control and local hospitals seeing more cases of young people vaping opioids and experiencing medical emergencies.

Most of the incidents in schools resulted in medical emergencies requiring medical attention. One article did not report the outcome. Another reported that the school nurse and two resource officers who found and touched the vape also experienced medical emergencies and were treated with Narcan. However, it should be noted that this not being an accurate depiction of opioid effects. Overall, six incidents resulted in an overdose and two resulted in the death of the individuals using the substances.

Each of the reported incidents occurred in different regions across the US (CA, CO, WV, TN, CT, PA), Canada and Poland, and included a mix of urban and rural areas, suggesting that this trend may not be constrained to any one geographic location or population density.

## Conclusions

Minimal attention has been directed towards using opioids in vapes despite the fact that opioids are a leading cause of drug overdose associated deaths in the US.<sup>9</sup> Given the dearth of research on this topic, the scope of the problem remains unclear. Due to the serious consequences associated with this behavior, we have outlined several recommendations to better understand the magnitude of the problem to inform policy and intervention responses.

First, there is a clear need to educate the public about this potential public health concern and correct misperceptions about opioids. We reviewed reports of individuals allegedly overdosing after touching a vape containing fentanyl and needing Narcan. However, touching fentanyl is unlikely to lead to an overdose;<sup>10</sup> this sensationalizing of drug use indicates a lack of understanding about substances such as fentanyl, perpetuates stigma, and reduces the acceptance of prioritizing a coordinated response to the problem. To mitigate the harms associated with this phenomenon, it will be important to educate the public and gain mainstream buy-in for a coordinated policy response.

Second, research is needed to uncover if the ease of vaping during the school day is increasing access to these drugs and perpetuating the development of problematic substance use and substance-related consequences. Previous research has long established that peer use and normative beliefs lead to increased substance use among youth.<sup>11</sup> Similar to how vaping has spread through peer to peer interactions, introducing tobacco to a new generation who otherwise would have remained nicotine-naïve, vaping opioids could introduce opioid-naïve youth to this class of drugs, potentially normalizing this behavior.<sup>12</sup> Thus, targeted prevention education may be needed for youth to counteract this behavior.

Third, e-cigarettes are often portrayed as a harm reduction tool, although the literature is mixed about whether this is accurate. Studies have demonstrated that marketing e-cigarettes as tobacco harm reduction tools lead to more favorable impressions and increased use among young adults.<sup>13</sup> However, the harm reductions for using e-cigarettes rather than cigarettes are not true when using opioids; it remains unclear if harm reduction messaging

might lead individuals to believe that vaping opioids is a safer alternative. Further research is needed to better understand the beliefs and motivations behind vaping opioids.

Fourth, it is critically important for national health behavior surveys to monitor the use of recreational drug use in vapes among both youth and adults. In our review of the literature, we found mostly news media reports of this phenomenon. It is possible media outlets have sensationalized this behavior, but it is also possible that this phenomenon is underreported, particularly among youth given the protected status of minors. Furthermore, it is also unclear the motivation for vaping opioids. Developing policies and programs to combat this behavior necessitates an understanding of the reasons for vaping opioids. For example, similar to what occurred during the EVALI outbreak, it is possible that some individuals are unintentionally vaping opioids through contaminated vaping products. Many people impacted by EVALI had accessed contaminated vape products through informal sources (i.e., online) rather than products sold in a store.<sup>8</sup> It may be the case that individuals are also being exposed to opioids unintentionally through buying products from informal sources. This may be of particular concern among youth given they cannot legally purchase vaping products from a vape retailer. More research is needed to determine how much of this behavior is intentional versus unintentional exposure to inform a response to this issue.

Finally, it is paramount that frontline workers and schools are prepared for the risk of illicit substances being used in vapes. Training for front line workers and school personnel should cover information to reduce stigmatizing beliefs about medically indicated substance use, and proper use and handling of these substances as well as opioid agonists (i.e., Narcan) in emergency situations. Having opioid agonists readily available for school nurses, law enforcement and first responders will be critical in curbing serious adverse consequences associated with this behavior. Taking action now is critical to implement prevention programs and policies to ensure further harms do not occur.

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