



Driving under the influence of opioids among high school students in Atlantic Canada: Prevalence, correlates, and the role of medical versus recreational consumption



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ABSTRACT

Objective: Employing a sample of 3655 senior students (grades 10 and 12, median ages of 16 and 18, respectively) in Atlantic Canada, this paper examines the risk factors associated with driving under the influence of opioids (DUIO), comparing medical versus recreational opioid users. The associations of DUIO with driving under the influence of alcohol, cannabis, and being a passenger of an impaired driver are also examined.

Methods: Participants were drawn from the 2012 Student Drug Use Survey in the Atlantic Provinces, an anonymous cross-sectional survey of junior and senior high school students in three Atlantic Canadian provinces. Logistic regression techniques were employed in the analysis of unadjusted and adjusted models.

Results: Among all senior students, the prevalence of DUIO in the past year was 4.3%. For those who had used a prescription opioid at least once in the past year, the rate of DUIO was 14%, with a higher rate among medical and recreational users (25.1%) compared to those using opioids only for medical purposes (9.6%). The predictors of DUIO were higher SES, higher sensation seeking, lower parental attachment, and being a recreational prescription opioid user. DUIO was strongly associated with other risky driving and passenger behaviours among recreational opioid users.

Conclusions: DUIO is an emerging socio-legal and road safety issue, with implications for public health. Prescription opioid use intentions matter, with recreational users exhibiting most risky driving behaviour than medical users. Effort must be placed on educating prescription opioid users about potential impairment while driving.

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1. Introduction

The use of opioids for pain management is common and widespread. In the last five years, Canada has become the second largest per capita consumer of prescription opioids after the United States (International Narcotics Control Board, 2013), and 1 in 5 Canadians report use in the preceding 12 months (Health Canada, 2012). Opioids comprise a broad range of natural and synthetic compounds such as morphine, codeine and oxycodone that are frequently used for pain relief, common brands of which include Percocet, OxyContin and Tylenol (Health Canada, 2009). A consequence of the greater availability of opioids has been an increase in recreational or non-medical use (Cicero et al., 2011; Dhalla et al., 2011; Fischer et al., 2006; Gugelmann and Perrone,

2011; Tetrault et al., 2008). Increasing rates of recreational opioid use among youth is a particular concern (Boak et al., 2013; Sung et al., 2005).

A potential side effect of opioid consumption is impairment of the skills necessary for the safe use of a motor vehicle. Using simulators and active cognitive testing, a number of studies have compared the psychomotor performance and driving-based skills of subjects who have taken opioids versus non-medicated controls. In many studies, no significant differences in driving ability were observed between patients who had taken an opioid and 'healthy controls' or patients who were opioid-free (Byas-Smith et al., 2005; Menefee et al., 2004) and in one such study, subjects under the influence of opioids actually outperformed cerebrally compromised patients on most tasks (Galski et al., 2000). However, other studies have found that patients taking opioids have significantly slower reaction times compared to healthy controls (Nilsen et al., 2011; Schindler et al., 2004) and carry out more unsafe driving actions (Dubois et al., 2010; Dassanayake et al., 2012).

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It has been speculated that study differences in the effect of opioids on driving may relate to the type and dose of opioid administered; a recent study has shown a dose-response effect on driving ability, such that stronger opioids impaired driving performance to a greater extent than weaker opioids (Gomes et al., 2013). Equally important, the mixed evidence on the impairment of driving ability associated with use of opioids may be related to the type of individuals studied, namely long-term opioid users (such as those with chronic pain), where weaker effects on driving performance are noted (Mailis-Gagnon et al., 2012; Wilhelmi and Cohen, 2012). Conversely, studies employing infrequent or intermittent users, such as those who use for recreational purposes and who ingest a sudden, high dose of opioids, are more likely to experience increased impairment and a reduced ability to drive (Mailis-Gagnon et al., 2012; Wilhelmi and Cohen, 2012).

Other than alcohol and marijuana, opioids are one of the most frequently detected drugs among drivers who have been involved in a collision (Ahlm et al., 2009; Ch'ng et al., 2007; Walsh et al., 2004; Sjogren et al., 1997). Estimates of the prevalence of opioid use among drivers range from around 4% (Papadodima et al., 2008) to around 20% (Keller et al., 2009; Drummer et al., 2003; Ch'ng et al., 2007). Many jurisdictions that have introduced lower limits for impaired driving or zero tolerance policies for alcohol and drugs have seen a sharp increase in the number of impaired driving cases submitted for toxicological analysis (Jones, 2005; Ojaniemi et al., 2009) and hence the detection of opioids in driver fluid samples has increased over the last few years (Christophersen, 1997; Jones, 2005; Ojaniemi et al., 2009).

Evidence suggests that motor vehicle collision mortality ratios in the US – adjusted for age, sex and race – are elevated in drivers who have consumed opioids (ratio 2.8, 95% CI, 2.1–3.5) (Callaghan et al., 2013). Similar heightened risks of crash have been found in UK (Gibson et al., 2009), Netherlands (Movig et al., 2004), Norway (Engeland et al., 2007) and in Canada (Vingilis and Wilk, 2012), and have been confirmed in systematic and literature reviews (Dassanayake et al., 2011; Fishbain et al., 2003; Kelly et al., 2004; Leung, 2011). In particular, a recent meta-analysis by Elvik (2013) estimated the relative risk of crash involvement associated with the use of opioids to be increased for all crash types, whether involving injury (OR = 1.94 (1.51–2.5)), fatalities (OR = 2.13 (1.23–3.72)) or property damage (OR = 4.76 (2.10–10.80)).

What has not been addressed in the literature is the prevalence of driving under the influence of opioids (DUIO) among young drivers. Reported rates of driving under the influence of alcohol or cannabis are higher amongst youth relative to the adult population, suggesting that special attention to young drivers is warranted (Asbridge et al., 2005; Chou et al., 2006). Moreover, while estimates of the prevalence of opioids in the blood of drivers involved in crashes exist, many studies do not distinguish between legal prescriptions and the use of illicit drugs. Studies estimating the number of drivers apprehended with opioids in their blood who have used them for illicit purposes have put the rate as high as 80% or 90% (Jones et al., 2008; Poklis et al., 1987). In these cases, drivers suspected of driving under the influence of drugs are impaired not as a result of side effects of consuming a prescription drug legally, but as a result of the illegal ingestion of controlled substances (Poklis et al., 1987; Ravera et al., 2009).

The purpose of this study is to examine the extent to which senior high school students (in grades 10 and 12, median ages of 16 and 18, respectively) in Atlantic Canada, who have consumed prescription opioids, engage in DUIO. Our research questions are: (1) what is the prevalence of DUIO among high school students? (2) What are the key risk factors associated with DUIO? and (3) Do “use intentions” (medical versus recreational) shape DUIO behaviour? The last question is important given recent evidence

suggesting that individuals who use opioids recreationally are quite distinct from those who use them on the advice of a physician (Ghandour et al., 2013). As such, it is important to assess whether intentions to use opioids affect the incidence of DUIO among high school students.

2. Methods

2.1. Participants

Data for the present study are taken from the 2012 Student Drug Use Survey in the Atlantic Provinces (SDUSAP), the fifth iteration of an anonymous cross-sectional survey of students in the Atlantic Provinces. The SDUSAP surveyed students from grades 7, 9, 10 and 12 attending schools in three of the Atlantic Provinces: Nova Scotia, New Brunswick and Newfoundland and Labrador. Students who attended both Anglophone and Francophone public schools were included in the 2012 SDUSAP; students attending private schools or schools on reserve were excluded. Youth who had left school or who were absent from school on the day that surveys were administered were not represented in the sample. In the Atlantic Provinces a learners driver's license can be first obtained at 16 years of age.

The sample design of the SDUSAP was a two-stage stratified cluster sample of randomly selected classes containing at least 20 students in the surveyed grades within each health region of the three participating provinces. The sampling frame allowed for approximately proportional representation of each province, within each health region, within each grade (7, 9, 10 or 12); thereafter, the sample was allocated according to school size. All students who participated in the survey needed parental consent to do so, unless they were 19 years of age or older. The questionnaire was derived from the prototype provided in the Canadian guidelines for self-reported adolescent drug use surveys and the survey was validated prior to its initial use in 1996 (Poulin et al., 1993).

Two weeks prior to administering the survey, an information letter was sent home to parents of selected students informing them of the survey date and detailing the survey material. Parental consent was obtained via ‘active’ or ‘passive’ means, depending on the requirements of the school board and the preferences of the individual school. All students also provided personal consent on the day of the survey administration and were free to withdraw from the survey at any time. Ethics approval for the survey was granted by the Dalhousie University Health Sciences Research Ethics Board. The total sample was 9226 students in grades 7, 9, 10, and 12 in the three provinces, with a response rate of 90% among students present on the day of survey administration. The average age of participants was 15 years and 48.5% of respondents were male.

The sample was further refined for the current analysis to include only senior students; those in grades 10 (median age of 16 years) and 12 (median age of 18 years). Given that age 16 is Canada's driver's licensing age, coupled with our focus on driving behaviour, it was necessary to restrict the analysis to only those youth eligible to drive. Thus our analytic sample was 3655 senior students.

2.2. Variables

The main dependent variable in this study is driving under the influence of opioids (DUIO), which was defined by the question “In the past 12 months, how often have you driven a vehicle within an hour of using a prescription pain relief pill such as Percocet, Percodan, Tylenol #3, Demerol, Oxycontin, or codeine? (We do not mean regular Tylenol or Aspirin that anyone can buy in a

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