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## A Descriptive Study of Drug Use among Iranian Drivers Involved in Fatal Road Accidents

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**Background:**

Although the problem of substance use among drivers is not limited to a special part of the world, most epidemiological reports on this topic have been published from industrial world.

**Aim:**

To determine drug use among Iranian drivers who were involved in fatal road accident.

**Methods:**

This study enrolled 51 Iranian adults who were involved on a fatal vehicle accident and were imprisoned thereafter. Data came from a national survey of prisoners. Data was collected at entry to seven prisons during a 4 month period in 2008 in different regions of the country. Self-reported drug use was measured. Commercial screening tests were applied to detect substance use (opioids, canaboids, methamphetamines, and benzodiazepines).

**Results:**

Drug use screening showed three distinct patterns of recent illicit drug use: opioids (37.3%), cannabis (2.0%), opioids and cannabis (13.7%). 29.4% were positive for benzodiazepines. Substance use screening test detected an additional 23.5% of participants as drug users, who had declined to report any drug use.

**Conclusion:**

Opioids are the most commonly used illicit drug used in the drivers who are involved in vehicle accidents with fatality. The high rate of drug use in drivers who involve in vehicle accidents with fatality reflects the importance of drug use control as a part of injury prevention in Iran. There is also a need for drug screening after fatal car accidents, as more than 20% of users may not declare their use.

**Keywords:** Substance use, drugged driving, Iran, drivers, driving, road accidents, injury

**Introduction:**

Driving under the influence of drugs may happen for several reasons.

Recreational drug use may be prevalent among people who drive (1). Drugged driving happens if the driver is a drug user (2, 3). It may happen among professional drivers who want to drive long distance (4). Drivers who drive under the influence of drugs pose all road users to serious risk (4, 5).

Although the effects of various drugs are not the same, most substances affect driving tasks, even in low dosages (6). That means an additional risk of crash is present even in the absence of outward signs of impairment in the driver (4, 6). In addition to the risk of traffic accident itself, drug use also increases the probability of poor clinical outcomes following car accidents (7). It has been shown that risk of death in traffic accident is increased when it is secondary to substance use (7,15,17).

Prevention of drugged driving is an essential action to reduce road accident fatalities. Authorities and policy makers, however, cannot design continued drug use education, and prevention if they do not have access to epidemiological information. Such information may be used to implement policies and enforcements that finally reduce traffic mortality and injury that is attributed to drugs. (4)

As epidemiological pattern of substance use varies from one geographic location to another, health authorities who are interested to improve road safety need local epidemiological knowledge about the context of drugged driving. Authorities can screening tests for substances in the suspected cases based on the epidemiological information about the pattern and type of drugs that are used among drivers. (8) In some settings that opioids are not commonly used, suspected individuals for drugged driving undergo drug tests which do not cover opioids or heroin (1).

Besides the high economic burden of drugged driving, and the fact that surveys on driving under the influence of substances have important implications for enforcement and prevention (5), limited epidemiological information on this problem are available in developing countries (1). Indeed, almost all published epidemiological knowledge in this field originates from North America, Europe, and Australia (2).

Different approaches have been used to provide epidemiological information on drugged driving (9-17). This includes population-level surveys, surveys of professional drivers, roadside surveys, and studies on drivers who become involved in crashes (18, 19). One approach is to conduct the study among individuals who are being arrested or imprisoned following fatal crashes.

In Iran, there is limited information regarding drugged driving. From few studies that have provided epidemiological information on drugged driving (20-24), no one has been conducted on individuals who are being imprisoned for fatal road accidents. Main purpose of the current study was to describe the role of drugged driving in fatal car accidents in Iran. We also measured possible discrepancies between self reported and test results for some prevalent substances.

## **Methods:**

### **Design and setting**

This national cross sectional study carried out by the Health & Treatment Bureau of Iran prisons Organization, Tehran, Iran. Data collection was conducted in the last 4 months in 2008.

Ethics committee approved our study, and informed consent was received from all participants. Our participants were reassured that the data will be kept confidential, especially from the prisons / correctional personnel. All questionnaires were registered anonymous. No incentive was given to the participant.

### **Participants and sampling:**

This study included 51 participants who were all imprisoned because of motor vehicle accident resulting in serious bodily injury or death. Participants were selected from 2,200 prisoners who were selected by a national survey from 7 prisons in different regions of the country. Prisons were located at different provinces including Tehran, Azarbayjan e Sharghi, Golestan, Sistan & Balouchestan, Balouchestan, Yazd, and Kermanshah. The prisons were selected randomly by using table of random numbers. Within each prison, we used a census sampling of male new prisoners.

### **Measures and measurements:**

At the time of entry to prison, participants underwent a structured interview using our questionnaire. Interviews were conducted in private setting by a trained staff. All interviewers had a degree of master of clinical psychology, and all were men (same gender with patient). Drug use during lifetime, last year and previous month, and also type and mode of drug use were asked. Drugs that were asked included cannabis, opium, opium derivates, powder heroin, compact heroin,

Methamphetamine, cocaine, LSD and other drug. Mode of drug use included smoking, swallowing, sniffing, injection, and inhalation.

### **Drug screening**

Blood stored in vacutainer tubes containing preservative were screened for drugs using enzyme-linked immunosorbent assay and gas chromatography-mass spectrometry analysis. Commercial screening tests were used for marijuana, Meth, and Opioids. These tests detect the presence of delta-9-tetrahydrocannabinol (THC), the active ingredient in marijuana, for cannabis and methamphetamine for Meth.

### **Data Analysis**

We used SPSS for data analysis. Due to low sample size, this study only provided descriptive statistics. We reported frequency tables for categorical variables. Mean and standard deviation (SD) were reported for continuous variables.

## Results:

### Descriptive statistics

All participants were men, and most were living in urban areas. Most participants were employed, married, and had not completed high school. Most participants did not have a history of previous imprisonment. (Table 1)

Participants' age ranged from 21 to 56 years, with a mean (SD) of  $32.4 \pm 7.9$  years. Monthly income ranged from 0 to 1,200 US \$, with a mean (SD) of  $290 \pm 211$  USD. Family size ranged from 1 to 14 persons with a mean (SD) of  $4 \pm 2$  persons.

### Self reported results

Based on self reported data, most frequent experienced drug during the last 30 days was opium (25%) followed by heroin or opium derivatives (20%). 8% reported cannabis use. Although 4% reported alcohol use in their life time, none of the participants reported alcohol use over the past 30 days. Most common mode of drug use was smoking (81% of cases), followed by swallowing (17.5% of cases). (Table 2)

### Drug screening

Drug tests were positive for opioids, cannabis and both in 37.3%, 2.0% and 13.7%, respectively. From all participants, 29.4% tested positive for benzodiazepines. Drug screening test detected 23.5% of total sample as drug users, who had not reported drug use. (Table 3)

From participants who had not reported drug use, 24% (n=12) tested positive for illicit drugs. Inaccurate report of no drug use was seen for cannabis (10-12%), and opioids (6-14%), but not for Meth (0%). (Table 4)



## Discussion:

Based on our pilot study, 60% of Iranian drivers who are involved in fatal car accidents use drugs, and in the absence of drug screening, 1/3 of total drug users will be missed. As a result, investigation of drugged driving among Iranians who are engaged in fatal car accidents should not merely rely on self-reported data. Most commonly used drug among drivers involved in fatal crash is opioids, following by cannabis.

The high rate of drug use among adults who are imprisoned for fatal crashes can be explained by the known association between driving under the influence of drugs and incidence and intensity of car accidents (47). Drugs are known to impair mental function and reduce attention and concentration on the driving tasks. In general, use of substances during driving may cause impaired coordination, impaired reaction time, and inability to judge distance and speed. It also results in distortions of time, place and space. Other effects of drug use are poor vision and muscle weakness. All these consequences may result in traffic accidents (4, 6).

We could not find any published information about the drug use screenings after crashes in Iran. Most of our knowledge is about pattern of illicit drug use among Iranian drivers. In one study, 0.42 percent of applicants for driving licenses in Iran had positive opioid test results (20). In one study in Kerman, Iran, between 14.6 and 26.5 percent of drivers were opium addict (22, 23).

A major part of the literature has screened cases suspected of driving under the influence of drugs (1, 25, 48-50). Studies that have screened individuals involved in car accidents show very different rates (10).

In Australia, cannabis (46.7%) was the most commonly found drug in injured drivers involved in motor vehicle collisions. The next most prevalent substance was

benzodiazepines (15.6%), followed by opiates (11%), amphetamines (4.1%) and methadone (3%). Cocaine was detected in 1.4% of cases (26). In Hong Kong, 10% of this sample tested positive for drugs. (27) In Australia, 2.7% of individuals involved in car accidents reported use of cannabis before crash (26). **From drivers killed as a result of a crash, 48% tested positive for alcohol or drugs.** From those drivers who tested positive, 27% were positive for alcohol only; 19% for cannabis only; 28% for alcohol and cannabis (but no other drug), and 25% for a combination of drugs, including the combination of alcohol and/or cannabis. From all deceased drivers who were positive for a combination of drugs (other than alcohol or cannabis), 23% were positive for opioids; 31% were positive for benzodiazepines, and; 42% were positive for methamphetamine (28).

In contrast to our study, in many industrial countries, marijuana and alcohol are the most prevalent **substances** found among impaired drivers who were involved **in fatal or non-fatal** vehicle crash. Other illegal drugs such as benzodiazepines, cocaine, opiates, and amphetamines may **have lower prevalence in industrial countries (3)**. In our country, opioids are the most commonly found drug among these individuals.

Pattern of drug use in subsamples of a community is affected by the epidemiology of drug use in that community. We believe that this is not exception for the case of driving under the influence of drugs. (29-34) In most western countries, marijuana and alcohol are the most prevalent drug used by general population (35).

**The most commonlu used drugs are opioids in Iran (36). In Iran, 3 of 4 illicit drug users use opioids (37).** In Iran, opium has not been used as a drug but also for self medication. Iran has a higher rate of opium usage in compare with other countries

such as United States or European countries. (38). Iran accounts for about 85% of worldwide seizures of opium and more than 30% of worldwide seizures of heroin and morphine (39). Traditionally, opioids have a long history for both recreational and medical purposes in Iran. Iranian geographic place is also important, locating as on the main opium trade route from Afghanistan to Europe (40).

Regarding the common modes of drug use, smoking and eating was most common in our sample. This was expected as smoking is the most common mode for use of opioids among Iranian general population (36). The same finding has been reported among professional drivers (41). Based on a recent national study, opioids (46.8%) and heroin (27.6%) were the two most common drugs used by Iranian professional drivers. (41)

Based on our study, only 4% of individuals imprisoned for fatal vehicle accidents reported alcohol use. This rate was less than 1 percent of the total professional drivers who used drugs in Iran (41). Based on some but not all reports, Alcohol is not a commonly used substance in Iran (42). This might be partially due to the fact that over 98% of the Iranians are Muslims and Islamic instructions and also legal rules in the country ban its use (43-45). There are also other parts of the world where alcohol is not a prevalent substance used by drivers (5, 28).

Our findings may have important public health implications for fatalities due to drugged driving and unintentional injury prevention in Iran. Iran is a developing country with a high incidence of fatal road traffic crashes compared to other societies. The rate of deaths due to road traffic accidents in Iran is higher than world average (21). A proportion of these fatalities have been attributed to the high rate of substance use of drivers in this country (22).

Current study suggests design and implementation of drug screening and also random drug testing at police stations. There might be also a need for a revision in current policies regarding charges of drugged drivers. These may prohibit driving under influence of drugs and also promote traffic safety in Iran.

Post crash drug testing is not conducted routinely in several parts of the world. In many places, drug analysis occurs under the request of police officers only. We believe that universal drugs screening for drivers who are involved in fatal motor vehicle collisions is needed in Iran, and opioids and cannabis might be considered more important than alcohol.

Communities with no screening tests among drivers may have high drugged driving (26). An important component of road safety efforts is anti-substance driving policies. Such policies may decrease societal burden of drug use in motor vehicle drivers. Screening tests should however cover different substances in each country. The presented epidemiology of drug use among Iranian drivers may help Iranian policy makers in this regard. At least, routine screening of suspected drivers should be considered.

The disturbingly high rate of drug use among individuals who were involved with fatal car accidents requires introduction of further initiatives to prevent drug use in motor vehicle drivers. Based on our results, a more emphasize is needed on drug impaired driving laws in Iran. Such policies can help police personnel to detect drivers that are impaired by drugs.

Our findings reveal the importance of empowering preventive measures through road safety programs and persuasive communications to minimize the rate of substance use among drivers. These interventional programs should emphasize on the role of illicit substances on driving performance and drug-related dangerous outcomes

to change the attitudes and beliefs of drivers (46). Constant educational programs in schools and through media along with strict regulations for driver's license delivery are necessary to control the rate of drugged drivers and prevent possible crashes in road traffic accidents. (41)

The current study has some limitations. **Data were not updated (2008). Sample size was also small.** This limitation is because the main study was not designed specifically for investigation of drugged driving but was done to investigate drug use among Iranian prisoners. **The results may not be representative of all drivers or fatal crashes in Iran. Data was not available on professional drivers who drive for a living or they merely were vehicle operators. Also, we did not know the location of accidents (metropolitan areas or high-speed inter-city highways).**

The study, however, had its own strengths. In addition to the self-reported data, we used screening tests. Further studies will be needed in this regard. Published guidelines are believed to improve the overall quality of drugged driving research. (10)

### **Conclusion:**

In Iran, prevalence of self-reported drugged driving is less than the actual use. Drug screening should be **implemented** for suspected cases of drugged driving. Opioids and cannabis are within drugs which should be included in **national drug screenings of drivers.**

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Table 1: Socio-demographic data among individuals who were imprisoned for fatal car accidents (n=51)

	n	%
<b>Living place</b>		
Urban	32	62.7
Rural	19	37.3
<b>Educational level</b>		
Illiterate	7	13.7
Read / write	2	3.9
Primary school	13	25.5
Guidance school	16	31.4
High school	3	5.9
Diploma	6	11.8
University	4	7.8
<b>Marital status</b>		
Single	16	31.4
Married	34	66.7
Divorced	1	2.0
<b>Employment</b>		
Employed	47	92.2
Jobless	4	7.8
<b>Previous imprisonment</b>		
No	26	51.0
1	18	35.3
2 or more	7	13.7

Table 2: Self reported history of drug use among Iranian adults imprisoned for car accident offenses (n=51)

	<b>lifetime</b>		<b>last year</b>		<b>Last month</b>	
<b>Cannabis</b>	n	%	n	%	n	%
No	41	80	45	88	47	92
Yes	10	20	6	12	4	8
<b>Opium</b>						
No	30	59	36	71	38	75
Yes	21	41	15	29	13	25
<b>Meth</b>						
No	49	96	49	96	51	100
Yes	2	4	2	4	0	0
<b>Ecstasy</b>						
No	50	98	50	98	51	100
Yes	1	2	1	2	0	0
<b>Heroin</b>						
No	35	69	38	75	41	80
Yes	16	31	13	25	10	20
<b>Opium derivatives</b>						
No	14	27	38	75	41	80
Yes	37	73	13	25	10	20
<b>Opioids</b>						
No	24	47	27	53	30	59
Yes	27	53	24	47	21	41
<b>Any drug</b>						
No	24	47	27	53	30	59
Yes	27	53	24	47	21	41
<b>Alcohol</b>						
No	49	96	51	100	51	100
Yes	2	4	0	0	0	0

Table 3: Drug test results among Iranian adults imprisoned for car accident offenses  
(n=51)

	n	%
<b>Opioids</b>		
Positive	26	51
Negative	25	49
<b>Meth</b>		
Positive	0	0
Negative	51	100
<b>Cannabis</b>		
Positive	8	16
Negative	43	84

Table 4: Frequency of inaccurate history of drug use among Iranian adults imprisoned  
for car accident offenses (n=51)

	n	%
<b>Opioids</b>		
Life time	3	6
Last year	5	10
Last month	7	14
<b>Cannabis</b>		
Last month	6	12
Last year	5	10
Life time	5	10
<b>Meth</b>		
Life time	0	0
Last year	0	0
Last month	0	0
<b>Any drug</b>		
last month	12	24
last year	10	20
Lifetime	12	24

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