

Prevalence of consumption of psychoactive substances amongst Moroccan taxi drivers

OMAR LARAQUI¹, SALWA LARAQUI^{2,3}, NADIA MANAR^{2,3}, TARIK GHAILAN³, REDA HAMMOUDA³, FRÉDÉRIC DESCHAMPS¹, CHAKIB EL HOUSSINE LARAQUI^{2,3}

¹Department of Occupational Health Medicine Faculty, Reims, France

²Graduate School of Health Engineering, Casablanca, Morocco

³Moroccan Society of Occupational Health Research, Casablanca, Morocco

KEY WORDS: Taxi drivers; addictive substances; socio-demographic and occupational characteristics; Morocco

PAROLE CHIAVE: Tassisti; sostanze stupefacenti; caratteristiche lavorative; Marocco

SUMMARY

Background: *The prevalence of psychoactive substances is constantly increasing in developing countries, and all professional sectors are concerned. Taxi drivers are a particular target because of the dangerousness and complexity of their work. However, few studies have investigated toxic habits in this population.* **Objectives:** *The aim of the study was to determine the prevalence of the use and misuse of addictive substances in taxi drivers and to appreciate poly-consumptions according to socio-demographic and occupational characteristics.* **Methods:** *This cross-sectional study took place in five big cities during the second quarter of 2014, and was conducted amongst 2,927 taxi drivers who went through official, obligatory control areas on a daily basis. The questionnaire covered socio-demographic and occupational characteristics, toxic habits (tobacco, alcohol, cannabis and others psychotropic substances). The misuse was assessed by specific tests: Fagerström test for tobacco smoking, Cannabis Abuse Screening Test (CAST) and DETA (Diminuer, Entourage, Trop, Alcool) test for alcohol.* **Results:** *The prevalence of consumption was 36.6% for smoking tobacco, 18.4% for cannabis, and 10.5% for alcohol. Amongst consumers, the prevalence of dependence or misuse was 36.6% for smoking tobacco, 37.2% for cannabis and 56.5% for alcohol. Fifty point three percent had no toxic habit, 35 % had one toxic habit, 11.5% had two toxic habits, 2.7% had three toxic habits and 0.6% had four toxic habits. The most frequent associations were tobacco-alcohol (6.8%) and tobacco-cannabis (4.1%).* **Conclusions:** *The elaboration of the prevention approach needs a cooperative spirit. It will be more accepted and applied if all taxi drivers, their representatives and road safety officers are involved in its preparation.*

RIASSUNTO

«**Prevalenza del consumo di sostanze psicoattive tra i tassisti marocchini**». **Introduzione:** *La prevalenza dell'utilizzo di sostanze psicoattive è in costante aumento nei paesi in via di sviluppo e interessa tutti i settori professionali. I tassisti sono una categoria particolarmente a rischio a causa della pericolosità e della complessità del loro lavoro. Tuttavia, pochi studi hanno indagato il consumo di sostanze in questa popolazione.* **Obiettivo:** *Determinare la prevalenza dell'uso e dell'abuso di sostanze che danno dipendenza tra i tassisti marocchini e stimare la prevalenza di policonsumo, anche in base a caratteristiche sociodemografiche e occupazionali.* **Metodi:** *Lo studio trasversale si è svolto in cinque grandi città del Marocco nel secondo trimestre del 2014, ed è stato condotto su 2.927 tassisti. Il questionario di raccolta dati includeva caratteristiche sociodemografiche, lavorative e consumo di sostanze (tabacco, alcol, cannabis*

e altre sostanze psicotrope). Lo stato di abuso e dipendenza è stato accertato attraverso test specifici: test di Fagerström per la valutazione della dipendenza da nicotina, test per lo screening della cannabis (CAST) e test DETA (Diminuer, Entourage, Trop, Alcool) (versione francese del test CAGE) per l'alcool. **Risultati:** La prevalenza del consumo è risultata del 36,6% per il tabacco, del 18,4% per la cannabis e del 10,5% per l'alcol. Tra i consumatori, la prevalenza della dipendenza o dell'abuso è risultata del 36,6% per il tabacco, del 37,2% per la cannabis e del 56,5% per l'alcol. Il 50,3% del campione non riporta alcuna abitudine tossica, il 35% l'uso di una sola sostanza, l'11,5% due, il 2,7% tre e lo 0,6% quattro. Le associazioni più frequenti sono risultate quelle alcol-tabacco (6,8%) e tabacco-cannabis (4,1%). **Conclusioni:** I risultati del nostro studio sottolineano la necessità di strategie di prevenzione in questa categoria professionale. L'approccio più efficace sembra essere quello collaborativo, con coinvolgimento, fin dalla sua preparazione, dei tassisti, dei loro rappresentanti e delle autorità preposte per la vigilanza.

INTRODUCTION

The prevalence of toxic habits is constantly increasing in developing countries and all occupational sectors are affected (4, 18, 23, 30). Taxi drivers are a particular target because they are exposed to high psychosocial and organizational constraints related to difficult working conditions and financial difficulties, with worries about their daily gain. This laborious activity, with irregular and atypical work and numerous constraints, requires courage and commitment on the part of taxi drivers (2, 22). Abusive behavior in relation to working conditions and daily life are associated with health problems in taxi drivers. Work shift, density of work, years of labor in taxi-driving, frequency of fright while driving, pattern of taking meals, way of recuperation on rest days or holidays, obesity, smoking, and intake of coffee and alcohol are found to be factors affecting the health of taxi drivers (40).

The 2013 World Health Organization Status Report on Road Safety estimated that approximately 1.24 million deaths occur annually due to road traffic crashes with most of the burden falling on low- and middle-income countries (46). In the last two decades, number of vehicles and urban traffic in major Moroccan cities have more than tripled, and the population has more than doubled, while road infrastructure has improved only slightly. In Morocco, road accidents are very costly because of human and material losses and the roads are among the deadliest in the world. Mortal accidents per vehicle are approximately 10 times higher than in France or in the United Kingdom. Speeding, non-compliance

with traffic laws and the use of psychoactive substances are the main causes of these accidents (22, 31). All psychoactive substances cause a disorder of alertness, a change in the perception of risk, and/or an increased risk-taking with consequences in terms of traffic safety, public health, and occupational medicine. Driving under the influence of illegal and legal psychotropic substances constitute an important cause of traffic accidents. Several epidemiological studies have shown a positive association between their consumption and the risk of having traffic accidents (1, 3, 6, 8, 9, 11, 32, 33, 35, 36, 38, 44, 45). Alcohol is a recognized leading contributor to road accidents and its association with traffic accident risk has been extensively demonstrated (1, 3, 8, 11, 36, 38, 44, 45). Nevertheless, impaired driving involving insomnia, sleep debt and/or sleep apnea with daytime sleepiness causes, each year, a great number of traffic accidents independently of alcohol and drug use (13, 14, 21, 22).

However, few studies have in some way investigated the toxic habits amongst taxi drivers in Morocco (2, 22). The aim of this study was to determine the prevalences of the consumption of addictive substances, and the use and misuse amongst taxi drivers according to socio-demographic, and occupational characteristics.

METHODS

Subjects

This epidemiological, observational and cross-sectional study took place in five big Moroccan cit-

ies during the second quarter of 2014. The number of inhabitants in these cities varied between one million and four million. This survey concerned 2,927 taxi drivers who went through official, obligatory control areas on a daily basis. All participants were male and older than 21 years, with length of employment above one year. The cities have been selected according to the residence of the investigating physicians who carried out this study as part of their work to get the occupational medicine diploma.

Questionnaire

We used an individual questionnaire which included sociodemographic (age, family status, and educational level) and professional characteristics (length of employment, working rhythm, and daily working time) and toxic habits (tobacco, cannabis, alcohol and others psychoactive substances). For tobacco smoking, we have individualized current smokers, former smokers and non-smokers. Subjects were categorized as current smokers if they smoked at the time of the survey or if they had stopped less than three months before the study and had smoked more than 100 cigarettes during their life. Former smokers were those who had stopped more than three months before the study and smoked more than 100 cigarettes during their life. Non-smokers are those who have never smoked or smoked less than 100 cigarettes during their life (10). We quantified the consumption of tobacco in pack-years (number of packs smoked per day multiplied by the number of years of smoking). The Fagerström test was used for the dependence assessment of tobacco smoking (12, 41). The items were summed to yield a total score of 0 to 10. The ordering of dependence was very low (0 to 2), low (3 to 4), moderate (5 to 6), high (7 to 8), and very high (9 to 10). For cannabis smoking, in the same way, we have categorized our population to current consumers, former consumers and non-consumers. We quantified the consumption in calumet-years. Among cannabis smokers, we used the Cannabis Abuse Screening Test (CAST) (17). This test includes six items. To calculate a score, the responses are coded on a scale from 0 to 4. The total score obtained can range from 0 to 24, and indicates whether or not the questioned

users are at risk. A score less than 3 indicates no addiction risk, a score of 3 or less than 7 indicates low addiction risk, and a score of 7 or above indicates high addiction risk.

Alcohol consumption was quantified in number of standard drinks per day. A standard drink contains a fixed amount of pure alcohol, i.e. 10 g. A standard drink is equivalent to 10 cl of table wine at 12°, 25 cl of beer at 5°, 3 cl of whisky at 40°, and 7 cl of aperitif at 18°. Among drinkers, we have appreciated the risky consumption (abuse and/or dependence) by the DETA (Diminuer, Entourage, Trop, Alcool) test (7, 47). This test includes four items; two positive answers connote risky consumption. According to WHO, risky consumption may cause serious harm in the medium to long term. For men it is more than 3 glasses per day or more than 21 glasses per week or more than 4 glasses per opportunity to drink.

We defined the use as a moderate or occasional consumption with a low risk to health, and the misuse as a consumption that may cause physical, social and/or psychological troubles. The misuse includes hazardous or spot abuse, harmful or repeated abuse and addiction. We considered misusers as:

- Dependent cigarette smokers with a Fagerström test score greater than or equal to 5,
- Addiction cannabis smokers with a CAST score greater than 7,
- Risky alcohol consumers having two positive answers in the DETA test or meeting the WHO criteria's (more than 21 glasses per week or more than 4 glasses per opportunity to drink).

Procedure of the study

We previously contacted the representatives of the associations of taxi drivers to explain the purpose of the study and obtain their support. The interview with each taxi driver lasted between 15 and 20 minutes, with full respect of the confidentiality. They answered the questionnaire without difficulty and with enthusiasm.

Statistical analysis

The statistical analyses were performed using the SPSS version 11.5 software package. The differ-

ences between groups were compared using t tests for continuous variables and chi-square tests for categorical ones. The statistical level of significance was established at 5%. For a proportion, we calculated the lower and upper limits of the 95% confidence intervals (CI).

RESULTS

Demographic and occupational characteristics of taxi drivers (table 1)

The average age of total population was 40.7 ± 10.3 years (range 21–73 years). Twenty-four point two percent were living alone and 75.8% in couple. Fifteen percent were illiterate, 12.6% had attended Koranic School, 29.1% primary school, 35.1% secondary school, and 8.2% university. The average length of employment was 11.9 ± 3.2 years.

The prevalences of harmful habits were as follows: tobacco smoking: 36.6%, 95% CI [34.8;38.3], tobacco snuff: 5.8%, 95% CI [4.9; 6.6], hookah: 7.3%, 95% CI [6.4;8.2], cannabis smoking: 18.4%, 95% CI [17; 19.8], alcohol consumption: 10.5%, 95% CI [9.4; 11.6], and other psychotropic substances: 2.7%, 95% CI [2.1; 3.3]. The average age of onset of smoking tobacco was 14.9 ± 4.6 years, cannabis smoking 18.2 ± 3.5 years, alcohol consumption 19.3 ± 4.6 years, tobacco snuff 25.7 ± 5.8 years, hookah 19.6 ± 4.3 years, and other psychotropic substances consumption 29.6 ± 3.7 years. The average daily amount of tobacco smoking was 15 ± 6.2 cigarettes, of shisha 1.1 ± 0.7 , of tobacco snuff 22 ± 7.8 snuffs, of cannabis smoking 12 ± 3.5 calumets, and of alcohol 2.1 ± 0.7 drinks. The harmfulness of tobacco smoking to health was

known by 100% of taxi drivers, alcohol by 96%, cannabis by 71%, tobacco snuff by 41%, and hookah by only 32%. Eighty-nine percent of tobacco sniffers were former tobacco smokers. The hookah was considered safer for health by 69% of consumers who considered that dangerous substances smoked were filtered by water. Attempts at weaning longer than 2 days of abstinence were made by 58.1% of tobacco smokers, 57% of alcohol drinkers, 32.1% of cannabis smokers, 27% of hookah smokers and 21% of tobacco sniffers.

Association between sociodemographic characteristics and toxic habits (table 2)

The average age of tobacco smokers was 39.6 ± 9.1 years, hookah smokers 34.8 ± 6.7 years, tobacco sniffers 46.1 ± 6.3 years, cannabis smokers 37.6 ± 8.2 years, alcohol consumers 38.6 ± 7.9 years and other psychotropic substances users 43.5 ± 2.8 years. The prevalence of tobacco smoking (40.2% vs. 33.4%; $p=0.052$), hookah (10.2% vs. 4.5% $p=0.0001$), cannabis smoking (24.3% vs. 13.1%; $p=0.0001$) and alcohol consumption (11.4% vs. 9.6%; $p=0.375$) was higher among taxi drivers under 40 years old. The prevalence of tobacco snuff (8.1% vs. 3.2%; $p=0.0001$) and psychotropic substances consumption (3.8% vs. 1.3%; $p=0.0001$) was higher in subjects over 40 years old. The prevalence of toxic habits was higher among people living alone, except for tobacco snuff and other psychotropic substances. The prevalence of toxic habits (tobacco smoking, tobacco snuff, hookah, cannabis smoking and alcohol consumption) was lower among those with a level of Koranic education.

Table 1 - Prevalences of toxic habits

Toxic habits N=2,927	No users	Former users	Current users
Tobacco smoking	1,259 (43)	598 (20.4)	1,070 (36.6)
Tobacco snuff	2,585 (88.3)	173 (6)	169 (5.8)
Hookah	2,546 (86.9)	168 (5.7)	213 (7.3)
Cannabis smoking	2,169 (74.1)	450 (15.3)	308 (18.4)
Alcohol Consumption	1,843 (62.9)	544 (18.6)	540 (10.5)
Other psychotropic substances	2,789 (95.2)	60 (2)	78 (2.7)

n (%)

Table 2 - Association between sociodemographic characteristics and toxic habits

	N = 2,927	TS 1,070 (36.6)	S 169 (5.8)	H 213 (7.3)	A 308 (10.5)	C 540 (18.4)	OPS 78 (2.7)
Age (years)							
<40	1,394 (47.6)	558 (40.2)	45 (3.2)	143 (10.2)	160 (11.4)	339 (24.3)	19 (1.3)
≥40	1,533 (52.4)	512 (33.4)	124 (8.1)	70 (4.5)	148 (9.6)	201 (13.1)	69 (3.8)
Family status							
Lives alone	707 (24.2)	311 (44)	18 (2.5)	99 (14)	109 (15.4)	179 (25.3)	15 (2.1)
Lives in couple	2,220 (75.8)	759 (34.2)	151 (6.8)	114 (5.1)	199 (9)	361 (16.3)	63 (2.8)
Educational level							
Illiterate	441 (15)	158 (35.8)	34 (7.7)	18 (4.1)	48 (10.9)	77 (17.5)	6 (1.4)
Koranic education	368 (12.6)	114 (31)	36 (9.8)	5 (1.4)	32 (8.7)	23 (6.3)	1 (0.3)
Primary	852 (29.1)	329 (38.6)	62 (7.3)	72 (8.4)	81 (9.5)	173 (20.3)	8 (0.9)
Secondary	1,027 (35.1)	385 (37.5)	31 (3)	85 (8.3)	116 (11.3)	217 (21.1)	32 (3.1)
Superior	239 (8.2)	84 (35.1)	6 (2.5)	33 (13.8)	31 (13)	50 (20.9)	31 (13)

TS: tobacco smoking; S: snuff; H: hookah; C: cannabis; A: alcohol; OPS: other psychotropic substances

Association between socio-professional characteristics and toxic habits (table 3)

The average length of employment for the total population was 15.6±4.7 years, for cigarette smokers 14.8±3.2 years, for hookah smokers 8.8±2.5 years, for tobacco sniffers 19.1±4.7 years, for cannabis smokers 13.5±5.2 years, for alcohol consumers of

14.8±3.1 years and for other psychotropic substances consumers 24.9±3.7 years.

Association between sociodemographic characteristics and misuse (table 4)

The average age of people who misuse was 41.8±8.1 years for tobacco smokers, 38.7±5.9 years for canna-

Table 3 - Association between socio-professional characteristics and toxic habits

	N = 2,927	TS 1,070 (36.6)	S 169 (5.8)	H 213 (7.3)	A 308 (10.5)	C 540 (18.4)	OPS 78 (2.7)
Length of employment (years)							
<5	651 (22.2)	268 (41.2)	7 (1.1)	111 (17.1)	87 (13.4)	139 (21.4)	3 (0.5)
5-15	1,229 (42)	453 (36.9)	83 (6.8)	76 (6.2)	116 (9.4)	257 (20.9)	16 (1.3)
>15	1,047 (35.8)	349 (33.3)	79 (7.5)	26 (2.5)	105 (10)	144 (13.8)	59 (5.6)
Working rhythm							
Typical	1,589 (54.3)	474 (29.8)	94 (5.9)	44 (2.8)	126 (7.9)	138 (8.7)	12 (0.8)
Atypical	1,338 (45.7)	596 (44.5)	75 (5.6)	169 (12.6)	182 (13.6)	402 (30)	66 (4.9)
Daily working (h)							
≤8	391 (13.3)	126 (32.2)	31 (7.9)	19 (4.9)	38 (9.7)	28 (7.2)	9 (1.9)
9-10	473 (16.2)	48 (10.1)	22 (4.7)	25 (5.3)	35 (7.4)	6 (1.3)	69 (3.3)
>10	2,063 (70.5)	896 (43.4)	116 (5.6)	169 (8.2)	235 (11.4)	506 (24.5)	0 (0)

TS: tobacco smoking; S: snuff; H: hookah; C: cannabis; A: alcohol; OPS: other psychotropic substances

Table 4 - Association between sociodemographic characteristics and misuse

	TS 391/1,070 (36.6)	A 174/308 (56.5)	C 201/540 (37.2)
Age (years)			
<40	169/558 (30.3)	78/160 (48.8)	86/339 (25.4)
≥40	222/512 (43.4)	96/148 (64.9)	115/201 (57.2)
Family status			
lives alone	225/311 (72.3)	85/109 (78)	72/179 (40.2)
lives in couple	166/759 (21.9)	89/199 (44.7)	129/361 (35.7)
Educational level			
Illiterate	96/158 (60.8)	34/48 (70.8)	31/77 (40.2)
Koranic education	31/114 (27.2)	16/32 (50)	4/23 (17.4)
Primary	113/329 (34.3)	49/81 (60.4)	76/173 (43.9)
Secondary	132/385 (34.2)	69/116 (59.4)	84/217 (38.7)
Superior	19/84 (22.6)	6/31 (19.4)	6/50 (12)

TS: tobacco smoking; C: cannabis; A: alcohol

bis smokers and 39.1±6.3 years for alcohol consumers. The misuse was significantly more frequent in people over 40 years old for tobacco smoking (43.4% vs. 30.3%; $p=0.0001$), alcohol consumption (64.9% vs. 48.8%; $p=0.006$) and cannabis smoking (57.2% vs. 25.4%; $p=0.0001$). For the three habits, misuse was significantly more frequent in people living alone: tobacco smoking (72.3% vs. 21.9%; $p=0.0001$), cannabis smoking (40.2% vs. 35.7%; $p=0.357$) and alcohol consumption (78% vs 44.7%; $p=0.0001$).

The misuse was significantly less common among people with a level of Koranic education.

Association between socio-professional characteristics and misuse (table 5)

The average length of employment of people with misuse was 14.1±3.8 years for cigarette smokers, 14±3.9 years for cannabis smokers and 16.1±4.8 for alcohol consumers. The prevalence of misuse was significantly higher among those working more than 8 h for tobacco smokers (37.1% vs. 32.5%; $p=0.371$), alcohol consumers (59.6% vs. 34.2%; $p=0.005$), and cannabis smokers (37.7% vs. 28.5%; $p=0.440$).

Table 5 - Association between socio-professional characteristics and misuse

	TS 391/1,070 (36.5)	A 174/308 (56.5)	C 201/540 (37.2)
Length of employment (years)			
<5	67/268 (25)	25/87 (28.7)	37/139 (26.6)
5-15	185/453 (40.8)	67/116 (57.7)	93/257 (36.1)
>15	139/349 (39.8)	82/105 (78.1)	71/144 (49.3)
Daily working (h)			
≤8	41/126 (32.5)	13/38 (34.2)	8/28 (28.5)
9-10	17/48 (35.4)	17/35 (48.6)	2/6 (33.3)
>10	333/896 (37.2)	144/235 (61.3)	191/506 (37.7)

TS: tobacco smoking; C: cannabis; A: alcohol

Prevalence of toxic habits and their associations (table 6)

Among total population, 50.3% had no toxic habit, 35% had one toxic habit, 11.4% had two toxic habits, 2.7% had three toxic habits and 0.6% had four toxic habits. The most frequent associations were tobacco-alcohol (6.8%), tobacco-cannabis (4.1%) and tobacco-cannabis-alcohol (2%).

Table 6 - Prevalences of toxic habits and their associations

0 toxic habit n=1473 (50.3)	Toxic substances	1,473 (50.3)
1 toxic habit n=1024 (35)	T	754 (25.8)
	A	134 (4.6)
	C	101 (3.5)
	P	35 (1.2)
2 toxic habits n=335 (11.5)	T + A	198 (6.8)
	T + C	119 (4.1)
	T + P	6 (0.2)
	A + P	1 (0.03)
	A + C	11 (4)
3 toxic habits n=78 (2.7)	T + C + A	59 (2)
	T + C + P	18 (0.6)
	C + A + P	1 (0.03)
4 toxic habits n=17 (0.6)	T + C + A + P	17 (0.6)
Total population		2,927 (100)

T: tobacco smoking; C: cannabis; A: alcohol; P: other psychotropic substances

DISCUSSION

In 2014 the Moroccan National Observatory for Drugs and Addictions (*Observatoire national marocain des drogues et des addictions*) reported that the prevalence of tobacco smoking and alcohol consumption among Moroccan male population in general aged 20 and over were 34.5% and 14% respectively (18). In our study, the prevalence of these harmful habits was 36.6% for tobacco smoking, 7.3% for hookah, 5.8% for tobacco snuff, 18.4% for cannabis smoking, 10.5% for alcohol consumption, and

2.7% for other psychotropic substances consumption. In a study about alertness amongst professional drivers in Morocco, the prevalence amongst taxi drivers was 45.7% for tobacco smoking, 11.8% for alcohol consumption, 9.9% for cannabis smoking and 4.4% for consumption of other psychotropic substances (22). In a survey about stress amongst taxi drivers in Fez, almost 50% of surveyed subjects were smoking tobacco (2). In another work about vigilance amongst professional heavy truck drivers in Casablanca, the prevalence of tobacco smoking was 49.6%, of alcohol consumption 11.8%, cannabis smoking 12% and consumption of other psychotropic substances 3.9% (21).

In the Moroccan general population, a study conducted by the Ministry of Health reported that the prevalence of tobacco smokers was 32% among men: 35.2% among those aged under 45s and 23% among those over 45s (30). However, in our study, the prevalence for these age groups was higher: 40.2% and 33.4% respectively. The most frequent associations were tobacco-alcohol (6.8%), tobacco-cannabis (4.1%) and tobacco-cannabis-alcohol (2%). Our results were similar to those of the health barometer 2014 of the National Institute of Prevention and Education for Health in France (INPES) where the prevalence of tobacco smoking among adults was 34.1%. According to this Institute, the association of tobacco-cannabis-alcohol concerned 1.8% and tobacco-alcohol 6.2% (15, 34). Several studies had reported that professional drivers smoked more than the general population: 66.3% in Israel (37), 54% in the USA (19) and 49% in China (20). The high consumption of psychoactive substances by our private taxi drivers can be explained by hard conditions at work (difficult traffic, stress and constraints during the wait for the customers, long daily working hours and atypical working rhythm, etc.), and social vulnerability (daily gain, low and irregular income, absence of social and medical insurance, etc.). Self-employed taxi drivers in China had a higher rate of neurotic problems, psychiatric diagnosis and a higher frequency of substance use than the city government-employed bus drivers (24). Even within the same country, however, it is possible to observe differences in the use of alcohol, as shown by the study on the use of alcohol in Italy (43).

The prevalence of consumption of psychoactive substances is inversely proportional to socio-economic status (10, 39). Professional driving is considered as a "high job strain" (16, 42). According to MC Cartt, 70.5% of drivers reported that their work schedules were irregular, and their day of rest was random (29). In the Sabbagh-Ehrlich study, 53.2% had an irregular working rhythm, 42% said that their employer forced them to work beyond the legal 12 hour daily limit and felt work stress (37). In our study, the irregular rhythm at work was associated with high prevalence of all toxic habits except for tobacco smoking. Forty-six percent of taxi drivers in Fez were stressed by difficult working conditions, 59% felt insecure at work and 68% suffered from job instability. Stress increased tobacco smoking among one-third of them (2). Daily work of more than ten hours among our drivers was associated with high prevalence of psychoactive substance use except for tobacco smoking. In our study, among users the prevalence of misuse was 36.6% for tobacco smoking, 37.2% for cannabis smoking and 56.5% for alcohol consumption, compared with a university-based study in Marrakesh, the rates of misuse for tobacco, cannabis and alcohol were 86.4%, 76.6% and 16.4% respectively (18). The prevalence of toxic habits among our taxi drivers living alone was more important than that of married drivers except for tobacco snuff and consumption of other psychotropic substances, the same result was found among Moroccan fishermen (23). In our survey, the prevalence of alcohol consumption of 10.5% was probably underestimated due to religious beliefs, cultural habits, regulations and laws because alcohol consumption is not allowed by Islam, that makes alcohol issues taboo. In the general Moroccan population, a study conducted by the Ministry of Health reported that 20% of men had rarely consumed alcohol (30).

Cannabis is the illicit drug most used in the world (15). It is cultivated in Morocco and costs less than manufactured tobacco. In our study, the prevalence of cannabis smoking among taxi drivers was 18.4%, more than double that of professional heavy truck drivers in Morocco: 7.5% (21) but it is lower than that of fishermen, which was 36.2% (5). Water pipe is known under different names in parts of the world: hookah, narghile, shisha or goza. It is

now the object of a renewed interest because its use has been spreading very fast among young people in Western countries and in Morocco. The number of bars and establishments where the water pipe can be smoked is increasing and almost are attended by mostly young people. The arguments they use for justifying water pipe smoking are the "natural", healthy and safety aspect of the product, its fruity flavors (apple, strawberry, etc.), the sharing of the dose enhancing a sense of community belonging, the novelty of the product, and a distinction from the smoking habits of adults. The conviction is that water acts as a filter and that this way of smoking tobacco is less dangerous than cigarette smoking. In our study, the hookah prevalence was 4.5% among the over 40s versus 10.2% among the under 40s, that confirmed the recent craze for this habit imported from the Middle East and considered nowadays as a world epidemic (5). The consumption of other psychotropic substances in our study was lower than that of Moroccan professional drivers: 2.7% versus 4.4% (22). A substantial number of studies have reported an increased traffic accident risk associated with the use of benzodiazepines (32, 35, 45).

The consumption of psychoactive substances is an alarming problem of public health and occupational safety. It has an impact on professional and social life and in case of accident the taxi driver is held responsible. It can threaten the safety of drivers and road users. Several legal texts about the fight against the consumption of addictive substances exist in Morocco. The physical and mental fitness of the professional driver has a twofold appreciation in Law 65-99 of the Labor Code, in Law 52-05 of the Traffic Code and in their application texts (26, 27). Like all workers, professional drivers are subject to occupational health Laws (Articles 304-341 of the Labor Code) and must undergo a medical examination for fitness for work by an occupational health physician. In addition, every two years, they must consult a doctor approved by the Ministry of Health (Article 14 of the Traffic Code) to obtain a medical certificate of driving fitness for the renewal of the driving license. The prevention of addictive behavior and its penalties are detailed in the Law related to the Traffic Code, the Penal Code and the Law related to the Commerce, Detention and Use

of Poisonous Substances (25). The latter Law combines the medical care of the consumers and the judicial repression of the dealers. Articles 39–42 of the Traffic Code compel professional drivers to receive ongoing formation from approved establishments. Article 177 deals with screening and criminal sanctions for driving under the influence of alcohol, narcotics or some medications that are forbidden while driving. However, professional drivers' knowledge of on the risks of the use of psychotropic substances while driving was very limited: 27% revealed to have information about the Traffic Code and 80.6% did not know the Moroccan legislation related to the use alcohol and narcotics while driving (28).

Our study presents two main limitations. Our survey was cross sectional, the healthy worker effect could create a selection bias. The weak points of self-reporting must be underlined especially for the consumption of psychoactive substances, mainly for alcohol. The prevalence of alcohol use was probably underestimated because the Muslim religion of our subjects prohibits its consumption, and the related issues remain taboo. There was no solution to avoid or limit individual variation in self-reporting. The target was a global quantification and approach. However, this study can be considered a faithful representation of the situation in Morocco, since it concerned all taxi drivers who went through official, obligatory control areas on a daily basis during the second quarter of 2014, and the cities have been randomly selected according to the residence of the investigating physicians.

CONCLUSION

The elaboration of the prevention approach needs a cooperative spirit. It will be more accepted and applied if all taxi drivers, their representatives, and road safety officers have been involved in its preparation. The implementation of information and sensitization campaigns about the danger of the consumption of psychotropic substances must be based on the results of prevalence surveys. Individual communications and collective actions must be conducted amongst taxi drivers. To give drivers information on road safety legislation and regulations, including the dangers related to the use of psycho-

active substances, is the cornerstone of prevention. The generalization of medical coverage and welfare for all professional drivers and the improvement of stressful working conditions must complete the information and education missions carried out in the health and education fields.

NO POTENTIAL CONFLICT OF INTEREST RELEVANT TO THIS ARTICLE WAS REPORTED BY THE AUTHORS

REFERENCES

1. Asefa NG, Ingale L, Shumey A, Yang H: Prevalence and factors associated with road traffic crash among taxi drivers in Mekelle town, northern Ethiopia, 2014: a cross sectional study. *PLoS One* 2015; 10: e0118675. doi: 10.1371/journal.pone.0118675
2. Berraho M, Nejari C, Erhazi K, et al: Mesure de stress professionnel des chauffeurs de taxis à Fès, Maroc. *Santé publique* 2006; 8: 375–387
3. Canadian Traffic Injury Research Foundation and Palmer SA. Drugs and driving: a compendium of research studies. Available at http://www.justice.gc.ca/eng/pi/rs/rep-rap/2006/rr06_8/p1.html (last accessed 15 October 2010)
4. Chems M, Rbai M, Echchachoui H, et al: Epidemiology of addictive behaviors among civilian air crew in Morocco. *med aéronautique et spatiale* 2009; 187: 25–29
5. Chaouachi K: Tout savoir sur le Narguilé : société, culture, histoire et santé. *Maisonneuve Et Larose* 2007; 256 pages
6. Del Río MC, Gómez J, Sancho M, Alvarez FJ: Alcohol, illicit drugs and medicinal drugs in fatally injured drivers in Spain between 1991 and 2000. *Forensic Sci Int* 2002; 127: 63–70. [PubMed]
7. Demortiere G, Pessione F, Batel P: Problèmes liés à l'alcool en médecine de travail. Dépistage par l'utilisation d'auto-questionnaires : intérêt, faisabilité, limites. *INRS, DMT* 2001; 85: 193–200
8. Drummer OH, Gerostamoulos J, Batziris H, et al: The involvement of drugs in drivers of motor vehicles killed in Australian road traffic crashes. *Accident Anal Prev* 2004; 36: 239–248 [PubMed]
9. Durand E, Gayet C, Laborde L, et al: Conduites addictives et travail. *INRS. DMT* 2008; 115: 339–362
10. El Rhazi K, Nejari C, Berraho, et al: Inequalities in smoking profiles in Morocco: the role of educational level. *Int J Tuberc lung dis* 2008; 12: 1327–1332
11. European Commission. Road Safety – Fitness to Drive. Available at http://ec.europa.eu/transport/road_safety/topics/behaviour/fitness_to_drive/index_en.htm (last accessed 15 October 2010)

12. Fagerström KO: Measuring degree of physical dependence to tobacco smoking with reference to individualization of treatment. *Addic behave* 1978; 3: 235-241
13. Garbarino S, Magnavita N, Guglielmi O et al: Insomnia is associated with road accidents. Further evidence from a study on truck drivers. *PLoS One* 2017; 12: e0187256. doi: 10.1371/journal.pone.0187256. eCollection 2017
14. Garbarino S, Durando P, Guglielmi O, et al: Sleep apnea, sleep debt and daytime sleepiness are independently associated with road accidents. A cross-sectional study on truck drivers. *PLoS One* 2016; 11. <https://doi.org/10.1371/journal.pone.0166262>
15. Goullé JP, Morel F: Addictions en milieu professionnel. Académie nationale de médecine, Paris. Rapport 10 octobre 2017. <http://www.academie-medecine.fr/articles-du-bulletinpublicationidpublication=100768>
16. Hedberg GE, Jacobson KA, Janlert U, Langendoen S: Risk indicators of ischemic disease among male professional drivers in Sweden. *Scand Journal Work Environ Health* 1993; 19: 326-333
17. Institut National de Prévention et d'Éducation pour la Santé (INPES). Repérage précoce de l'usage nocif du cannabis 2006; 4 p. <http://inpes.santepubliquefrance.fr/CFESBases/catalogue/pdf/982.pdf>
18. Jalal T, El Omari F, Sabir M: Rapport annuel de l'Observatoire national des drogues et addictions. Maroc, Rapport officiel 2014:108 p. www.onda-drogues.com
19. Koreliz J, Fernandez AN, Spirey GH, Browdy BL: Health habits and risk factors among truck drivers visiting a health booth during a trucker show. *Am journal health prom* 1993; 8: 117-123
20. Lam TH, Jiang CQ, HO SY, et al: Smocking and mortality in 81,344 drivers in Guangzhou in China- *Occupat envir med* 2002; 59: 135-138
21. Laraqui O, Laraqui S, Tripodi D, et al: Evaluation de la vigilance chez les conducteurs professionnels de poids lourds à Casablanca. *Archives des maladies professionnelles. Archives des Maladies Professionnelles et de l'Environnement* 2008; 69: 574-585
22. Laraqui S, Laraqui O, Tripodi D, et al : Prévalence et facteurs de risques des troubles de la vigilance chez les routiers professionnels au Maroc. *Santé publique* 2011; 23: 89-100
23. Laraqui O, Laraqui S, Manar N, et al: Prevalence of consumption of addictive substances amongst Moroccan fishermen. *International maritime health*, 2017; 68: 21-27
24. Lin SK, Lee CH, Pan CH, et al: Comparison of the prevalence of substance use and psychiatric disorders between government- and self-employed commercial drivers. *Psychiatry Clin Neurosci* 2003; 57: 425-431
25. Loi relative à la répression de la toxicomanie et la prévention des toxicomanes promulguée par le dahir n° 1-73-282 du 21-05-1974 et publiée au bulletin officiel n° 3214 du 05-06-1974; p 928
26. Loi n° 65-99 relative au code du travail promulguée par le dahir n° 1-03-194 du 11 septembre 2003 et publiée au bulletin officiel n° 5210 du 6 mai 2004, p.600-658
27. Loi n° 52-05 relative au code de la route promulguée par le dahir n° 1-10-07 du 11 février 2010 et publiée au bulletin officiel n° 5874 du 16 septembre 2010, p. 1646
28. Maataoui RB, Almasrar B, Maataoui SB, et al: Conduite au volant sous l'emprise de substances psychoactives. *International journal of innovation and applied studies* 2015; 13: 415-419
29. McCartt AT, Rohrbaugh JW, Hammer MC, Fuller SZ: Factors associated with failing asleep at the wheel among long distance truck drivers. *Accident analysis and prevention* 2000; 32: 493-504
30. Ministère de la santé au Maroc. Enquête sur la santé et la réactivité du système de santé au Maroc 2003; oct. 2007; 128p. [file:///C:/Users/Administrateur/Downloads/ESRSSM 2003%20\(2\).pdf](file:///C:/Users/Administrateur/Downloads/ESRSSM%2003%20(2).pdf)
31. Ministère de l'équipement du transport et de la logistique marocain. Direction des routes et des statistiques des accidents corporels de la circulation routière 2014. www.mtpnet.gov.ma/routiers/reseaux/statistiques-des-accidents
32. Orriols L, Salmi LR, Philip P, et al: The impact of medicinal drugs on traffic safety: a systematic review of epidemiological studies. *Pharmacoepidemiol Drug Saf* 2009; 18: 647-658 [PMC free article] [PubMed]
33. Paille F: Critères diagnostiques, cliniques et biologiques de la dépendance tabagique. In M. Reynaud, traité d'addictologie. Paris: Médecine -sciences Flammarion 2006: 418-423
34. Palle C: Synthèse de la revue de littérature sur les consommations de substances psychoactives en milieu professionnel. *Observatoire français des drogues et toxicomanies*, note 2015-05, 12 pp
35. Ravera S, Van Rein N, Gier J et al: Road traffic accidents and psychotropic medication use in the Netherlands: a case-control study. *Br J Clin Pharmacol* 2011; 72: 505-513. doi: 10.1111/j.1365-2125.2011.03994.x
36. Rosso GL, C. Montomoli, Candura SM : Poor weight control, alcoholic beverage consumption and sudden sleep onset at the wheel among Italian truck drivers: A preliminary pilot study. *Int J Occup Med Environ Health* 2016; 29: 405-416. DOI: <https://doi.org/10.13075/ijomeh.1896.00638>
37. 26 - Sabagh- Ehlish S, Friedman L, Richter ED: Working conditions and fatigue in professional truck drivers at Israeli port. *Inj Prev* 2005; 11: 110-114
38. Sobngwi-Tambekou JL, Brown TG, Bhatti JA: Driving under the influence of alcohol in professional drivers in

- Cameroon. *Traffic Inj Prev* 2016; 17 Suppl 1: 73-78. doi: 10.1080/15389588.2016.1199867
39. Tessier JF, Nejari C, Bennani, Othmani M: Le tabagisme dans les pays méditerranéens: Europe, Maghreb, Moyen -Orient. *Données d'une enquête coopérative. Int J Tuberc Lung Dis* 1999; 3: 927-937
40. Ueda T, Hashimoto M, Yasui I, et al: A questionnaire study on health of taxi drivers--relations to work conditions and daily life. *Sangyo Igaku* 1989; 31: 162-175
41. Underner M, Pierrot J, Peiffer G: Les tests d'évaluation de la dépendance tabagique. *Revue des maladies respiratoires* 2012; 29: 462-474
42. Useche SA, Serge A, Alonso F, et al: Alcohol consumption, smoking, job stress and road safety in professional drivers. *Journal Addiction* 2017; 8: 321
43. Venturelli F, Poscia A, Carrozzi G, et al: Prevalence of alcohol abuse among workers in Italy. *Med Lav* 2017; 108: 52-63. doi: 10.23749/mdl.v108i1.5581.
44. Verster JC, Van Der Maarel MA, McKinney A, et al: Driving during alcohol hangover among dutch professional truck drivers. *Traffic Inj Prev* 2014; 15: 434-438. doi: 10.1080/15389588.2013.833329.
45. Walsh JM, de Gier JJ, Christopherson AS, Verstraete AG: Drugs and driving. *Traffic Inj Prev* 2004; 5: 241-253. [PubMed]
46. World Health Organization: Global status report on road safety 2013: Supporting a decade of action. Geneva: World Health Organization; 2013. Available: http://www.who.int/violence_injury_prevention/road_safety_status/2013/report/en/
47. Yersin B: Les questionnaires de dépistage en alcoologie. *Alcoologie* 1999; 21: 397-401