

RESEARCH ARTICLE

Prevalence of consumption of psychoactive substances among construction workers

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Keywords

Construction workers • Addictive substances • Use • Misuse • Morocco

Summary

Introduction. The prevalence of psychoactive substance is constantly increasing in developing countries, and all occupational sectors are concerned. Construction sector is a particular target because of the heavy workload as well as family and social isolation. However, few studies have investigated toxic habits in this population in Morocco. The aim of this study was to determine the prevalence of addictive substances consumption, use, and misuse amongst construction workers and to appreciate the poly-consumption according to socio-demographic and occupational parameters.

Methods. This cross-sectional study was conducted amongst 1,128 construction workers. The interview with each person took place at occupational health service during his medical examination. The questions were formulated orally in French and/or in Arabic. The questionnaire covered socio-demographic and occupational parameters, toxic habits (tobacco, alcohol, cannabis and others psychotropic substances). The misuse was assessed by spe-

cific tests: dependence on smoking tobacco (Fagerstrom), Cannabis Abuse Screening Test (CAST) and Alcohol Use Disorders Identification Test (AUDIT).

Results. The prevalence of consumption was 47.9% for smoking tobacco, 12.7% for cannabis, and 20.1% for alcohol. Amongst consumers, the prevalence of dependence or misuse was 68% for smoking tobacco, 70.6% for cannabis and 63% for alcohol. 42.7% of construction workers had no toxic habit, 36.1% one toxic habit, 16.3% two toxic habits, 4.8% three toxic habits and 0.1% four toxic habits. The most frequent associations were tobacco-alcohol (8.1%) and tobacco-cannabis (3.7%).

Conclusions. Occupational health physicians have to play a key role in raising awareness and fighting against toxic habits. The prevention approach needs a cooperative spirit. It will be more accepted and applied if all construction workers and their representatives are involved in its elaboration.

Introduction

The prevalence of toxic habits is constantly increasing in developing countries and all occupational sectors are affected [1]. Construction workers are a particular target because they are exposed to strong psychosocial and organizational constraints related to difficult working conditions and financial difficulties, with a lack of employment prospects. This laborious activity, with job stressful demands, painful postures, atypical schedules and the distance of the family unit requires courage and strong involvement of the workers [2, 3]. Like immigrants, construction workers of rural origin have manual, tiring and dangerous activities (the so-called “3D Jobs”, *dirty, dangerous, difficult*), characterized by very intense rhythms, long hours of work and low income [4].

Moreover, the consumption habits of psychoactive substances are esteemed, or at least largely tolerated. Non-consumption can sometimes be a cause of exclusion aggravating then the social and family isolation of workers. This collective consumption being part of the sociability of the group, is a tool of discussion and debate about work’s difficulties [5, 6].

All psychoactive substances cause impaired alertness, a change in risk perception and/ or increased risk taking with consequences in terms of public health, prevention and work safety [7]. Work under the influence of illegal or legal psychotropic substances is an important cause of work-related accidents. Eighty two percent of workers in the construction sector reported injuries in the previous 12 months [8]. Several epidemiological studies have shown a positive association between their consumption and the risk of accidents at work in the building sector [9-11]. Security in construction is very worrying around the world. While much has been done to improve safety and health in developed countries, construction remains one of the most dangerous sectors because of its association with a high incidence of death and injury. According to global estimates by the International Labor Organization (ILO), more than 600,000 deaths have been reported each year in the construction sector [12]. The US Bureau of Labor Statistics reported that the highest number of fatal injuries among all sectors during the 2014 period occurred on construction sites, with at least 899 fatal workplace injuries [13].

However, few studies have focused on the evaluation of toxic habits in this population in Morocco. The aim of this study was to determine the prevalence of addictive substances consumption, use, and misuse amongst construction workers and to appreciate the poly-consumption according to socio-demographic and occupational parameters.

Methods

SUBJECTS

This observational and cross-sectional epidemiological study was conducted during in the 2017 and took place in a large building company of great works in Casablanca and Rabat. This survey involved all construction workers over 20 years old with at least two years of length of employment. The 1,128 employees were men and subdivided into three socio-occupational categories: 206 construction laborers (unskilled personnel), 802 bricklayers or masons (qualified personnel), and 120 foremen (supervisory personnel).

QUESTIONNAIRE

We used an individual questionnaire, which included sociodemographic (age, family status, and educational level) and occupational parameters (length of employment, working rhythm, and daily working time) and toxic habits: tobacco, cannabis, alcohol and others psychoactive substances. For the socio-occupational category, we have individualized construction laborers, bricklayers and foremen. The construction laborers (maneuvers) were defined as the people who work on site to do the physical work. The bricklayers (masonry workers) were defined as the workers using bricks, stone, concrete, and other materials. The construction foremen were supervising all aspects of the work. 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 lives. Former smokers were those who stopped more than three months before the study and smoked more than 100 cigarettes during their lives. Non-smokers are those who have never smoked or smoked less than 100 cigarettes during their lives [14]. We quantified tobacco consumption in pack-years (number of packs smoked per day multiplied by number of years of smoking). To assess the dependence of cigarette smokers, we used the Fagerstrom test [15, 16]. The items were summed to give 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, 18]. 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 indicated 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 whiskey at 40°, and 7 cl of aperitif at 18°. Among drinkers, we have appreciated the risky consumption (abuse and/or dependence) by the Alcohol Use Disorder Identification Test (AUDIT) [19-21]. This test is a 10-point screening tool developed by the World Health Organization (WHO) to assess alcohol consumption, alcohol-related behaviors and alcohol-related problems. A score of 8 or higher indicates the dangerous or harmful alcohol consumption. According to WHO, risky consumption can cause serious damage in the medium and long term. It corresponds in men to more than 3 standard glasses per day or to more than 21 standard glasses per week or to more than 4 standard glasses per drinking occasion.

We defined the use as a moderate or occasional consumption with a low risk to health, and the misuse is 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 Fagerstrom test score higher than or equal to 5;
- addiction cannabis smokers with a CAST score higher than 7;
- risky alcohol consumers having a score higher than or equal to 8 (AUDIT test) or meeting WHO criteria (more than 4 glasses per drinking occasion or more than 21 glasses per week).

PROCEDURE OF THE STUDY

We previously contacted the human resource manager and the occupational physician to explain the purpose of the study and obtain their agreement and support. The interview with each worker took place at occupational health services and was carried out in the respect of the confidentiality after his information on the interest of our study. It lasted between 15 and 20 min for each person. The questions were formulated orally in French and/or in Arabic.

STATISTICAL ANALYSIS

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

RELATIONSHIP BETWEEN SOCIODEMOGRAPHIC PARAMETERS AND TOXIC HABITS (TAB. I)

The average age of total population was 34.6 ± 7.1 years. 41.2% were living alone and 52.8% in couple. 22% were illiterate, 46.7% had attended primary school, 25.9% secondary school, and 5.3% college or university. In general, the laborers were illiterate or had a primary educational level, the bricklayers had a primary or secondary educational level, and the foremen had a high educational level.

For tobacco smoking, the prevalence of current users was 47.9%, 95% CI (45, 50.8), former users 12.2% and never users 39.9%. For tobacco snuff, the prevalence of current users was 13.5%, 95% CI (11.5, 16.4), former users 7% and never users 79.5%. For hookah, the prevalence of current users was 8.7%, 95% CI (7, 10.4), former users 4.1% and never users 87.2%. For cannabis smoking, the prevalence of current users was 12.7%, 95% CI (10.7, 14.6), former users 12.5% and never users 74.8%. For alcohol consumption, the prevalence of current users was 20.1%, 95% CI (17.7, 22.4), former users 14.9% and never users 65%. For other psychotropic substances, the prevalence of current users was 2.8%, 95% CI (1.8, 3.7), former users 2.2% and never users 95%.

The average age of tobacco smokers was 34 ± 6.1 years, hookah smokers 28.2 ± 4.4 years, tobacco sniffers 37.6 ± 6.4 years, cannabis smokers 33.5 ± 6.2 years, alcohol consumers 33.8 ± 5.1 years and other psychotropic substances users 41.1 ± 8.9 years.

The prevalence of tobacco smoking (49.4 vs 43%; $p = 0.075$), cannabis smoking (13.9 vs 8.9%; $p = 0.041$) and alcohol consumption (22.6 vs 12.2%; $p < 0.0001$) was higher among construction workers under 40 years. The prevalence of hookah (11.3 vs 0.4%; $p < 0.0001$), tobacco snuff (24.1 vs 10.1%; $p < 0.0001$), and psychotropic

substances consumption (6.3 vs 1.6%; $p < 0.0001$) was higher in subjects over 40 years. The prevalence of toxic habits was higher among people living alone.

The prevalence of toxic habits (tobacco smoking, tobacco snuff, hookah, cannabis smoking and alcohol consumption) was lower among those with a superior educational level except for hookah and psychotropic substances.

The average age of onset of smoking tobacco was 13.9 ± 2.6 years, cannabis smoking 17.3 ± 3.3 years, alcohol consumption 18.7 ± 3.6 years, tobacco snuff 28.3 ± 6.5 years, hookah 17.8 ± 4.6 years, and other psychotropic substances 31.2 ± 2.6 years.

The average daily amount of tobacco smoking was 14 ± 5.9 cigarettes, of shisha 1.2 ± 0.6 , of tobacco snuff 17 ± 5.6 , of cannabis smoking 16 ± 5.8 calumets, and of alcohol 2.9 ± 0.6 drinks.

The harmfulness of tobacco smoking to health was known by 88% of construction workers, alcohol by 75%, cannabis by 55%, tobacco snuff by 25%, and hookah by only 15%. 94% of tobacco sniffers were former tobacco smokers. The hookah was considered safer for health by 82% of consumers who believed that dangerous substances smoked were filtered by water.

Attempts of weaning more than 2 days of abstinence were made by 63.1% of tobacco smokers, 76.8% of alcohol drinkers, 25.9% of cannabis smokers, 42% of hookah smokers and 32% of tobacco sniffers.

RELATIONSHIP BETWEEN SOCIO-OCCUPATIONAL PARAMETERS AND TOXIC HABITS (TAB. II)

The occupational categories were bricklayers (71.1%), construction laborer (18.3%) and foremen (10.6%). The average length of employment was 10.9 ± 5.3 years. The average length of employment was 10.2 ± 4.9 years for cigarette smokers, 6.9 ± 4.1 years for hookah smokers, 11.4 ± 5.2 years for tobacco sniffers, 7.6 ± 4.4 years for cannabis smokers, 10.6 ± 4.3 years for alcohol

Tab. I. Relationship between socio-demographic parameters and toxic habits.

	N 1,128	TS 540 (47.9)	S 152 (13.5)	H 98 (8.7)	C 143 (12.7)	A 227 (20.1)	OPS 31 (2.7)
Age (years)							
< 30	450 (39.9)	182 (40.4)	25 (5.6)	68 (15.1)	41 (9.8)	93 (20.6)	6 (1.3)
30-39	408 (36.7)	242 (59.3)	62 (15.2)	29 (7.1)	78 (17.3)	101 (24.3)	8 (1.9)
40-49	213 (18.9)	101 (47.4)	63 (29.6)	1 (0.4)	24 (11.2)	29 (13.6)	9 (4.2)
≥ 50	57 (5)	15 (26.3)	2 (3.5)	0 (0)	0 (0)	4 (7)	8 (14)
< 40	858 (76.1)	424 (49.4)	87 (10.1)	97 (11.3)	119 (13.9)	194 (22.6)	14 (1.6)
≥ 40	270 (76.1)	116 (43)	65 (24.1)	1 (0.4)	24 (8.9)	33 (12.2)	17 (6.3)
Family status							
Lives alone	465 (41.2)	238 (51.1)	73 (15.7)	77 (16.5)	77 (16.5)	120 (25.8)	18 (3.9)
Lives in a couple	663 (58.8)	302 (45.5)	79 (11.9)	21 (3.1)	66 (9.9)	107 (16.1)	13 (2)
Children and/or dependents							
Yes	637 (56.5)	249 (39.1)	74 (11.6)	17 (2.7)	69 (10.8)	70 (11)	22 (3.5)
No	491 (32.3)	291 (59.3)	78 (15.9)	57 (16.5)	74 (15.1)	157 (32)	9 (1.8)
Educational level							
Illiterate	249 (22)	130 (52.2)	68 (27.3)	4 (1.6)	14 (5.6)	46 (18.5)	4 (1.6)
Primary	527 (46.7)	267 (50.7)	65 (12.3)	45 (8.5)	72 (17.9)	99 (18.8)	14 (2.6)
Secondary	292 (25.9)	131 (44.8)	18 (6.2)	44 (15)	42 (14.4)	70 (23.9)	11 (3.8)
Superior	60 (5.3)	12 (20)	1 (1.7)	5 (8.3)	0 (0)	12 (20)	2 (3.3)

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

Tab. II. Relationship between socio-occupational parameters and toxic habits.

	N 1,128	TS 540 (47.9)	S 152 (13.5)	H 98 (8.7)	C 143 (12.7)	A 227 (20.1)	OPS 31 (2.7)
Occupational categories							
Construction laborer	206 (18.3)	99 (48.1)	28 (13.6)	11 (5.3)	25 (12.1)	32 (15.5)	4 (1.9)
Bricklayers	802 (71.1)	396 (49.4)	107 (13.3)	34 (4.2)	101 (12.6)	158 (19.7)	17 (2.1)
Foremen	120 (10.6)	45 (37.5)	17 (14.2)	53 (44.2)	17 (14.2)	37 (30.8)	10 (8.3)
Length of employment (years)							
< 5	348 (30.8)	186 (53.4)	32 (9.2)	51 (14.7)	70 (20.1)	76 (21.8)	5 (1.4)
5-15	436 (38.7)	213 (48.9)	69 (15.8)	41 (9.4)	58 (13.3)	94 (21.6)	12 (2.7)
>15	344 (30.5)	141 (41)	51 (14.8)	6 (1.7)	15 (4.3)	57 (16.6)	14 (4.1)
Work schedule							
Typical	927 (82.2)	435 (46.9)	132 (14.2)	54 (5.8)	97 (10.4)	176 (19)	12 (1.3)
Atypical	201 (17.8)	105 (52.2)	20 (9.9)	44 (21.8)	46 (22.9)	51 (25.4)	19 (9.4)
Weekly working time							
≤ regulatory working time	267 (23.7)	119 (44.6)	22 (8.2)	30 (11.2)	44 (16.4)	62 (23.2)	9 (3.3)
> regulatory working time	861 (76.3)	421 (37.3)	130 (11.5)	68 (6)	99 (8.8)	165 (14.6)	22 (2.6)

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

consumers, and 13.7 ± 5.9 years for other psychotropic substances consumers.

RELATIONSHIP BETWEEN SOCIODEMOGRAPHIC PARAMETERS AND MISUSE (TAB. III)

The average age of people who misuse was 34.7 ± 5.8 years for tobacco smokers, 35.3 ± 4.5 years for cannabis smokers and 32.8 ± 6.7 years for alcohol consumers.

The misuse was more frequent in people over 40 years old for tobacco smoking (73.3 vs 66.5%; p = 0.201), alcohol consumption (75.7 vs 60.8%; p = 0.149) and cannabis smoking (91.7 vs 66.4%; p = 0.025).

For tobacco smoking (85.7 vs 54%; p < 0.0001) and alcohol consumption (65.8 vs 59.8 %; p = 0.426), misuse was more frequent in people living alone, but for cannabis (74.2 vs 67.5%; p = 0.489) misuse was more frequent in people living in couple.

For the three habits, the misuse was more frequent in people with secondary education level for tobacco smoking (92.4 vs 60.1%; p < 0.0001), primary education

level for cannabis smoking (75.9 vs 64.2%; p = 0.126) and illiterates ones for alcohol consumption (84.8 vs 57.5%; p = 0.001).

RELATIONSHIP BETWEEN SOCIO-OCCUPATIONAL PARAMETERS AND MISUSE (TAB. IV)

The average length of employment of people with misuse was 10.8 ± 4.9 years for cigarette smokers, 7.5 ± 4.1 years for cannabis smokers and 11.9 ± 5.1 years for alcohol consumers.

For the cannabis smokers, misuse was significantly more common among bricklayers than other occupational categories (73.3 vs 43.5%; p < 0.0001). The misuse of tobacco smoking (73.3 vs 67.5%; p = 0.627) and alcohol consumption (75.7 vs 60.5%; p = 0.117) was slightly higher among the foremen.

The prevalence of misuse was slightly higher among those working more than 8 h for cannabis smokers (74.7 vs 61.4%; p = 0.145) and alcohol consumers (64.2 vs 59.7%; p = 0.637).

Tab. III. Relationship between socio-demographic parameters and misuse.

	TS 367/540 (68)	C 101/143 (70,6)	A 143/227 (63)
Age (years)			
< 30	109/182 (59.9)	23/41 (56.1)	67/93 (72)
30-39	173/242 (71.5)	56/78 (71.8)	51/101 (50.5)
40-49	72/101 (71.3)	22/24 (91.7)	23/29 (79.3)
≥ 50	13/15 (86.7)	0 (0)	2/4 (50)
< 40	282/424 (66.5)	79/119 (66.4)	118/194 (60.8)
≥ 40	85/116 (73.3)	22/24 (91.7)	25/33 (75.7)
Family status			
Lives alone	204/238 (85.7)	52/77 (67.5)	79/120 (65.8)
Lives in a couple	163/302 (54)	49/66 (74.2)	64/107 (59.8)
Children and/or dependents			
Yes	243/249 (97.6)	59/69 (85.5)	39/70 (55.7)
No	124/291 (42.6)	42/74 (56.8)	104/157 (66.2)
Educational level			
Illiterate	87/130 (66.9)	9/14 (64.3)	39/46 (84.8)
Primary	151/267 (56.5)	66/87 (75.9)	59/99 (59.6)
Secondary	121/131 (92.4)	26/42 (61.9)	38/70 (54.3)
Superior	8/12 (66.7)	0(0)	7/12 (58.3)

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

Tab. IV. Association between socio-demographic parameters and misuse.

	TS 367/540 (68)	C 101/143 (70.6)	A 143/227 (63)
Length of employment (years)			
< 5	101/186 (54.3)	46/70 (65.7)	31/76 (40.8)
5-15	159/213 (74.6)	48/58 (82.8)	63/94 (67)
> 15	107/141 (75.9)	7/15 (46.7)	49/57 (86)
Average	10.8 ± 4.9	7,5 ± 4.1	11.9 ± 5.1
Occupational categories			
Construction laborer	47/99 (47.5)	17/45 (37,7)	18/32 (56.3)
Bricklayers	287/396 (72.5)	74/101 (73.3)	97/158 (61.4)
Foremen	33/45 (73.3)	10/17 (58.8)	28/37 (75.7)
Daily working (h)			
8	81/119 (68.1)	27/44 (61.4)	37/62 (59.7)
> 8	286/421 (67.9)	74/99 (74.7)	106/165 (64.2)

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

Tab. V. Prevalence of toxic habits and their associations.

Frequency	Toxics	N = 1,128
0 toxic habit 482 (42.7)	-	482 (42.7)
1 toxic habit 407 (36.1)	T	347 (30.8)
	C	5 (0.4)
	A	44 (3.9)
	P	11 (0.9)
2 toxic habits 184 (16.3)	T + C	42 (3.7)
	T + A	91 (8.1)
	T + P	5 (0.4)
	A + P	5 (0.4)
	A + C	41 (3.6)
3 toxic habits 54 (4.8)	T + C + A	45 (4)
	T + C + P	9 (0.7)
4 toxic habits 1 (0.1)	T + C + A + P	1 (0.1)

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

PREVALENCE OF TOXIC HABITS AND THEIR ASSOCIATIONS (TAB. V)

Among total population, 42.7% had no toxic habit, 36.1% one toxic habit, 16.3% two toxic habits, 4.8% three toxic habits and 0.1% four toxic habits. The most frequent associations were tobacco-alcohol (8.1%) and tobacco-cannabis (3.7%).

Discussion

In 2014, the Moroccan National Observatory for Drugs and Addictions reported that the prevalence of tobacco smoking and alcohol consumption among Moroccan male population in general aged 20 and over was 34.5% and 14% respectively [1]. In our study, the prevalence of these harmful habits was higher: 47.9% for tobacco smoking, 8.7% for hookah, 13.5% for tobacco snuff, 12.7% for cannabis smoking, 20.1% for alcohol consumption, and 2.8% for other psychotropic substances consumption. The National Institute for Prevention and Education for Health in France (INPES) ranked the construction sector at the first places in consumption of toxic substances with global monthly prevalence of 32.7% [22].

The construction sector, maritime sector, catering, arts and entertainment were at the top of the pyramid of psychoactive substances consumption [2].

Construction workers would smoke more than the general population for a number of reasons and a combination of several factors including stress, strong psychosocial and organizational constraints related to difficult working conditions and financial difficulties, with a lack of employment prospects. This laborious activity, with heavy workload (painful postures, long hours working, atypical schedules, outdoor working in inclement weather), and the family and social isolation requires courage and strong involvement of the workers [4, 5, 23]. Occupational stress appears as a possible risk factor exposing to toxic habits. In construction sector, stress is born of a high psychological demand, low decision latitude and insufficient social support, aggravated by arduous and dangerous working conditions [24]. Construction workers are among the categories the most exposed to various occupational hazards (physical, chemical, biological, ergonomic and psychological) [23]. This professional sector is more likely to incur occupational injuries, even fatal, and to develop respiratory and dermatological diseases [25]. Moreover, the consumption habits of psychoactive substances are largely tolerated, and non-consumption can sometimes be a cause of exclusion aggravating the social and family isolation of workers. This collective consumption being part of the sociability of the group is a tool of discussion and debate about work's difficulties [5]. Among male construction workers, being resident in Spain for 7 years and sharing a home with friends are the most associated risk factors for increased alcohol consumption [23].

According to the INPES 2010 Health Barometer, 36.2% of regular smokers, 9.3% of alcohol users and 13.2% of cannabis users reported having increased their consumption as a result of problems related to their work in the last 12 months [22]. However, these results should not obscure the fact that professional activity overall remains a protective factor against addictive behavior, compared to an unemployment situation [26, 27].

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 [28]. In our study, the prevalence for these age groups was higher: 49.4 and 43% respectively.

International studies among construction workers conducted in many countries have shown a high prevalence of consumption of psychoactive substances. For Tobacco smoking, the frequency was 46.7% in Algeria [27], 51% in Australia [10], 45.3% in France [2], 43.3% in USA [11], and 49.1% in Hong Kong [9]. According to a study led in New Delhi (India) among the construction workers, 91% were tobacco users and among them 49% were using smokeless tobacco, 29% were cigarette smokers, and 22% were smokers and tobacco chewers [29].

In no Muslim countries, the consumption of alcohol is a sociocultural lifestyle and widely prevalent among population. In Morocco, the purchase, sale and consumption of alcohol are legally prohibited to Muslim people but in practice everyone can buy it. The prevalence of its consumption in Australian population was 82.4% [10]. In USA, 20% of construction workers reported drinking every day and 29.5% mentioned binge drinking five or more times in the past 30 days [11]. In France, 32.7% of construction workers reported binge drinking in the past month [2]. In our study, lower prevalence (20.1%) can be explained by underestimation related to religious, cultural and legal considerations. Islam prohibits alcohol consumption and related issues are taboo.

Cannabis is the illicit drug most used in the world [16, 17, 30]. Socio-geographical, economic and cultural factors play an important role in its consumption. Cannabis is grown mainly in northern Morocco and consumed in all the country because it is cheaper than manufactured tobacco. Although its production, distribution, sale and consumption are legally forbidden [1]. The prevalence of its consumption in our study (12.7%) was similar to the one found in France (13%) [31], and lower than the one reported in Australia (30.5%) [10]. The survey on the cannabis consumption in the building sector in 2010, has showed that 13% of building employees consume cannabis daily, almost twice as much as the rest of the workforce (6.9%) [22].

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 cafes and establishments where the water pipe can be smoked is increasing and are attended mostly by young people. The arguments they use for justifying water pipe smoking are the “natural”, health 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 0.4% among those over 40 years vs 22.2% among the under 40s, that confirmed the recent craze for this habit imported from the Middle East and considered nowadays as a world epidemic [32, 33].

The use of other drugs (anxiolytic, antidepressant) by construction workers is difficult to assess, because they are used without medical advice [8, 9, 34, 35]. The literature suggests that drug abuse remains high in this population. Drug use includes not only the consumption of illicit drugs but also the misuse of prescription drugs such as sedatives, painkillers and stimulants [36, 37]. The construction community is more likely to experiment with cocaine and hallucinogenic mushrooms [21, 38]. The prevalence of this consumption in our study (2.8%) was much lower than that reported by the US (17%) and French (13.7%) surveys [2, 39, 40].

The prevalence of consumption of psychoactive substances is inversely proportional to socio-economic status [11]. The consumption of harmful habits among our construction workers living alone was higher than that of workers living in a couple, expect for cannabis. Living alone will be a source of social stress [27]. In our study, the prevalence of toxic habits was higher among people with low levels of education except for psychoactive substances. The MARTA survey conducted among the Moroccan population showed that the prevalence of cigarette smokers was inversely associated with the level of education among men. Thus, the risk was higher among illiterate men than among those with a university level of education [12]. The lower-educated and lower-income construction workers had higher smoking rates [41].

Five surveys carried out in different occupational sectors in Morocco: fishermen [42], health care workers [43], dockers [44], truck drivers [45] and taxi drivers [46], have shown that the construction workers were:

- in second position for alcohol consumption: 20.1 vs 36.6, 9.6, 16.5, 11.8 and 10.5% respectively;
- in third position for:
 - cannabis smoking: 12.7 vs 36.2, 3.3, 9.1, 11.7 and 18.4% respectively,
 - tobacco smoking: 47.9 vs 58.5, 17.1, 30.5, 49.6 and 36.6% respectively;
- and in last position for consumption of other psychotropic substances: 2.8 vs 9.3, 11.6, 3.2 and 4% respectively.

A French survey aimed at estimating the excess of a tobacco-related pathology expected in occupational populations had shown that the study of mortality in the construction industry found an excess of deaths from bladder cancer of 28%, while the expected tobacco excess is 8% [47]. According to the GAZEL cohort, certain work constraints increase alcohol consumption: outdoor work (more than half of working time), work in a painful or tiring posture, exposure to vibrations, heavy loads, long, tiring or fast movements [24]. There seems to be a multifactorial relation in which biological, psychological, cultural and social factors intervene. Some authors have associated hazardous alcohol consumption with the type of work [48]. Construction and agriculture, both open to the inclement weather, traditionally offer hard work conditions, and ingestion of alcohol before beginning work is a common habit [23]. The harmfulness of tobacco smoking to health was

known by 88% of our construction workers. In an American study, 43.5% of construction workers thought that smoking should be allowed, and only 30.7% thought that smoking had a harmful effect on their safety [9]. In our study, snuff was considered less harmful to health than tobacco smoking, and usually as a weaning of tobacco smoking. The harmfulness of alcohol to health was known by 75% of our construction workers, while all Latino masons had limited knowledge of what constituted unhealthy drinking, and few could identify strategies to reduce their consumption [49]. However, an Italian study has shown a reduction in average alcohol consumption among building workers over the past ten years, but confirmed the correlation between the frequency-severity of accidents, absenteeism and average consumption alcohol [49].

In our study, the prevalence of misuse was 68% for tobacco smoking, 70.6% for cannabis smoking and 63% for alcohol consumption. These frequencies would be significantly higher than those of the general population reported by the Moroccan Observatory for Drugs and Addictions with 2% for alcohol abuse, 3.3% for toxic substances abuse and 2.8% of misuse of toxic substances [1].

The frequency of misuse of alcohol among our construction workers (63%) was significantly higher than those reported in the literature: 38% in Australia [10], 30% in India [29], 21.3% in Italy [50], 12.4% in the United States [11] and 6.8% in Hong-Kong [9]. This dependence was more widespread among our construction workers aged between 40 and 50 (79.3%), the illiterate (84.8%), and with seniority over 15 years in 86% of cases and with atypical hours in 76.5%. The most frequent associations were tobacco-alcohol (8.1%), tobacco-cannabis-alcohol (4%) and tobacco-cannabis (3.7%). Our results were similar to those of the 2014 health barometer of the INPES: association of tobacco-alcohol concerned 6.2%, and tobacco-cannabis-alcohol 1.8% [2, 20].

The consumption of psycho-actives substances is an alarming problem of public health and occupation safety, and has an impact on occupational and social life. Unfortunately, we do not have any Moroccan statistics on occupational injuries related to alcohol and drug use but we have some figures on road accidents. The latter are very costly because of human and material losses and the Moroccan roads are among the deadliest in the world. A vehicle kills approximatively 10 times more 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. The human factor is responsible of more than 80% of road accidents and alcohol is responsible of 3 to 11% of road accidents [46]. Alcohol is a recognized leading contributor to road accidents. Several legal texts about the fight against the consumption of addictive substances exist in Morocco. The physical and mental fitness of the construction workers is stipulated in Law 65-99 of the Labor Code, and in its application texts [51, 52]. Construction workers 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 physician. The prevention of addictive behavior and its penalties are detailed in the Law related to the Penal Code and the Law related to the Commerce, Detention and Use of Poisonous Substances [53]. This latter Law combines the medical care of the consumers and the judicial repression of the dealers. Article 177 of the law related to the Traffic Code deals with screening and criminal sanctions for driving under the influence of alcohol, narcotics or some medications that are contraindicated while driving.

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 consumption 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.

Conclusions

Occupational health services are one of the pillars for conducting early interventions for prevention. In fact, work is the ideal place for the homogeneity of the population concerned, the free access to all employees and the possibility of follow-up activity. Construction workers are a population at high risk of psychotropic substances use. Collective and individual prevention measures and actions aimed at screening and increasing awareness are needed. The elaboration of the prevention approach needs a cooperative spirit. It will be more accepted and applied if all construction workers and their representatives are involved in its preparation. The occupational health physicians have to play a key role in the development and implementation of this preventive approach. The support and specialized care facilities must be available to ensure individual attention and early treatment when necessary. The implementation of information and sensitization about the danger of the consumption of psychotropic substances must be based on the result of prevalence surveys.

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Conflicts of interest statement

The authors declare no conflict of interest.

Authors' contributions

OL: conception, execution; wrote the paper, interpretation of data. NM: conception, execution; wrote the paper. SL: conception, execution; wrote the paper. RH: conception, execution. FD: conception, execution; wrote the paper. CL: conception, execution; wrote the paper, interpretation of data.

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