

## Factors associated with psychoactive drug initiation in a sample of workers in France: results of the VISAT cohort study<sup>†</sup>

O. Boeuf-Cazou PhD<sup>1\*</sup>, M. Niezborala MD<sup>2</sup>, J.C. Marquie PhD<sup>3</sup> and M. Lapeyre-Mestre MD/PhD<sup>1</sup>

<sup>1</sup>Université de Toulouse, UPS, Unité de Pharmacopépidémiologie EA3696, Faculté de Médecine Purpan, Toulouse, France

<sup>2</sup>Service Médical Interentreprises de Toulouse, Toulouse, France

<sup>3</sup>Laboratoire Travail et Cognition UMR 5263 CNRS, Université de Toulouse, France

### SUMMARY

**Purpose** To identify which psychosocial factors at work are associated with the initiation of psychoactive drug use in a cohort of healthy French workers.

**Method** This study used data collected from the VISAT ('Vieillesse, Santé, Travail') cohort which included workers aged 32, 42, 52 and 62 years in 1996 with follow-ups conducted over the following 5 years. Data were collected through interviews and five standardized questionnaires in annual occupational medical examinations in 1996, 1999 and 2001. We defined new consumers of psychoactive drugs according to their answers during the follow-ups and compared their psychosocial and working characteristics to non-consumers. A multivariate logistic regression analysis was performed to investigate factors related to a psychoactive drug initiation.

**Results** Among 1533 subjects, 5.4% began consuming psychoactive drugs during the follow-up with a twofold rate for women than for men. Factors related to psychoactive drug initiation were different according to gender. In men, initiation was mainly found in participants who were separated, showed high emotional reaction scores and were members of the white-collar working class. We did not find any other occupational factors associated to psychoactive drug initiation in men. By contrast, among women, drug initiation was more frequent in participants who were 52 years old and over, and whose job control-reward level was lower.

**Conclusions** Psychoactive drug initiation concerned 5.4% of workers within the 5-year interval in this study. The pressure of psychosocial environment was more important in men, whereas age and work-related psychosocial factors were the main factors associated with new consumption among women. Copyright © 2010 John Wiley & Sons, Ltd.

KEY WORDS — psychotropic drugs; workplace; cohort studies; gender; pharmacoepidemiology

Received 4 March 2009; Revised 3 November 2009; Accepted 24 November 2009

### INTRODUCTION

Over the past several years, many studies have focussed on the patterns of psychoactive drug consumption in the general population.<sup>1–3</sup> These drugs are widely prescribed and used in countries of Western Europe. The estimated prevalence rate of psychotropic drug consumption in the European population ranges from 5.9% (in Germany) to 19.2% in the French population.<sup>3,4</sup> Most of these studies underline that France presents the

highest consumption of psychoactive drugs in Europe with 8.7 million of consumers in 2005.<sup>4,5</sup> Anxiolytics and hypnotics are the main drugs consumed<sup>6</sup> but several studies have underlined an increase in antidepressant consumption in France over the last 20 years.<sup>7,8</sup> In France, the use of antidepressants was twice higher in 2003 compared to 1994.<sup>9</sup> Some studies showed that the use of psychoactive drugs was associated with female gender, old age, medium social class, loneliness, but also with health status, professional work difficulties and environmental or social factors.<sup>6,10–13</sup>

In developed countries, working conditions changed over the last decades of the 20th century due to increased international competition, intensification of

\* Correspondence to: Dr O. Boeuf-Cazou, Université de Toulouse, UPS, Unité de Pharmacopépidémiologie EA3696, Faculté de Médecine, 37 Allées Jules Guesde, F-31000 Toulouse, France. E-mail: boeuf@cict.fr

<sup>†</sup>The authors declare no conflicts of interest.

work, organizational downsizing, etc.<sup>14–16</sup> On the other hand, several data underline a relationship between working conditions and health status.<sup>17,18</sup> In France, the prevalence of psychoactive drug use among workers was estimated at 13% for men and 23% for women.<sup>19</sup> This prevalence has often been used as an indicator of mental disorders or difficulty to adapt to poor working conditions.<sup>20</sup> Some psychosocial factors at work have been associated with psychoactive drug use: perceived job difficulty, time constraints, low autonomy, excessive workload, etc.<sup>21,22</sup> However, this population is exposed to increased physically or psychologically stressful conditions. Psychoactive drugs are often consumed with a medical prescription for the treatment of anxiety, sleep or depressive disorders. These medications can also be self-administered for other purposes. In a recent study, this behaviour was called ‘professional doping’ because workers used drugs in order to face up to work-related problems.<sup>22</sup> Most studies have focussed on identifying and quantifying the factors associated with psychoactive drug consumption in the general and working population, but none studies have investigated the factors involved in initiating drug use. By using a prospective design it is thus possible to identify new consumers of psychoactive drug. Actually, working conditions might be responsible for it through an initiation of medical treatment or a self-medicated drug use. Moreover, several studies interested in factors associated with current psychoactive drug use among workers have revealed significant differences between men and women<sup>10,12,13</sup> such as occupational factors, which appeared more important in men than in women.<sup>13</sup> Therefore, it is important to conduct data analysis separately by gender.

The aim of this study was to identify which psychosocial factors at work are associated to the initiation of psychoactive drug use in a cohort of healthy French workers.

## METHODS

### *Study population and data collection*

The present study is part of a longitudinal French study called VISAT (Vieillessement, Santé, Travail).<sup>23</sup> It is a prospective cohort study whose aim is to underline the long-term impact of working conditions on health and ageing. The protocol has been previously described in detail elsewhere.<sup>23</sup> VISAT study included initially 3237 subjects (current or recently retired workers) born in 1934, 1944, 1954 or 1964 at baseline (1996). Participants were randomly drawn from the subject’s

lists of 94 volunteer occupational physicians in three regions of southern France. Data were collected through interviews during annual medical examinations by occupational physicians in 1996 and 2001. Five standardized questionnaires were administered during each evaluation to collect data on demographic and occupational characteristics, medical conditions, cognitive efficiency, lifestyle and supplementary medical tests. An intermediate evaluation realized in 1999 collected data concerning drug use.

For the purpose of this study, we included subjects who were interviewed at the two follow-up dates (1999 and 2001), and we excluded the workers retired in 1996, giving 1533 participants (Figure 1). General health status at baseline (1996) was evaluated through the reported frequency of sick leave during the previous 12 months, and three dimensions of the Nottingham Health Profile (‘energy’, ‘emotional reactions’ and ‘social isolation’).<sup>24</sup> We defined a dichotomous variable for each dimension to obtain an extreme value corresponding to the third quartile the VISAT questionnaire, all subjects filled-in a short version of the Cohen *et al.* perceived stress scale<sup>25</sup> that was interpreted through a general score (from 4 to 20 points). We defined the participants with a score > 10 (3rd quartile) as subjects who perceived high stress. Other dichotomous variables were also used: daily alcohol consumption (yes/no), tobacco consumption (current smoker/non-smoker or former smoker) and if the subject was afraid to lose his job in the future (yes/no). Occupational physicians also asked workers to report diseases diagnosed during the previous 5 years, so reactive depression could be identified in our population. To evaluate the association between psychosocial factors at work and psychoactive drug initiation, we used three factors for coding job stressors:<sup>26</sup> (1) the ‘job control-reward’ factor (JC-R), (2) the ‘physical strain’ factor (PS) and (3) the ‘psychological demand’ factor (PD). We defined a low JC-R if JC-R score < 3 (1st quartile), a high PS if PS score > -4 (3rd quartile) and a high PD if PD score > 4 (3rd quartile).

### *Measure of psychoactive drug consumption*

All participants were asked about the use of any drug. In the baseline questionnaire (1996), the exact drug name was not asked, only the therapeutic class was requested: drug use for depression, anxiety, sleep disorders, digestive problems or for any reason during the previous 3 months. In follow-up interviews (1999 and 2001), occupational physicians asked for the name of each medication used during the previous month. All

PSYCHOACTIVE DRUG INITIATION

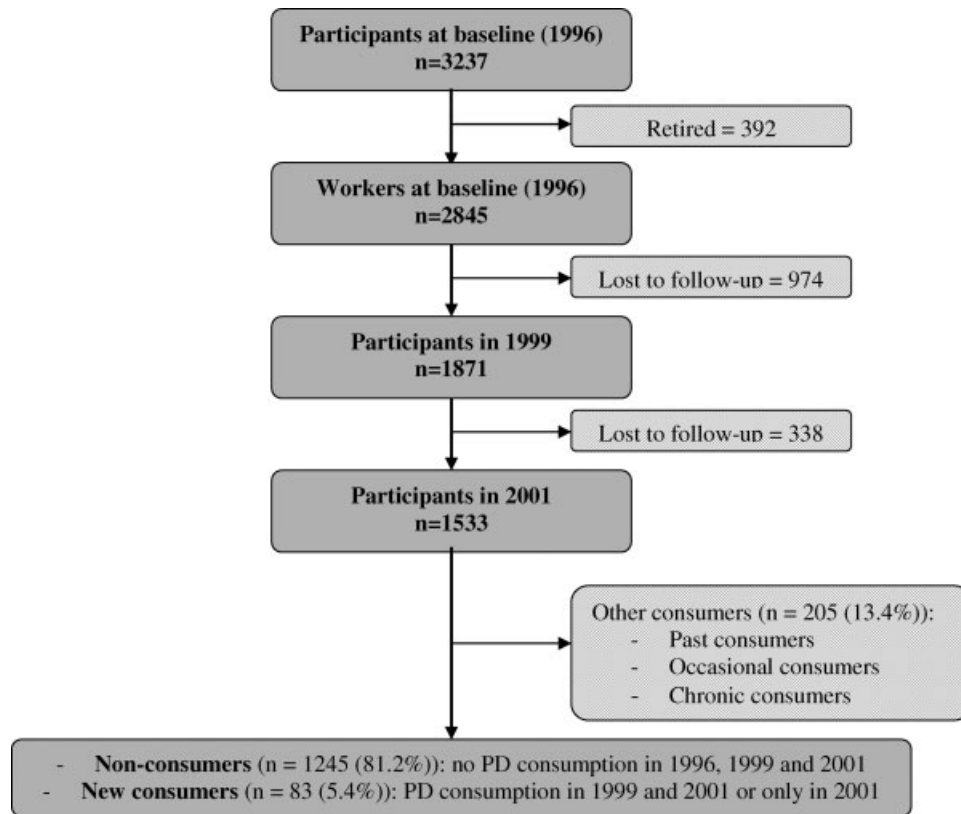


Figure 1. Description of different steps of inclusion (PD: psychoactive drug)

drugs were recorded in the interviews using brand names and coded according to the Anatomical Therapeutic Chemical (ATC) classification system. In 1996, psychoactive drug users were defined as subjects reporting drugs for depression, anxiety or sleep disorder. In the following interviews, we identified users using the ATC code: N05 (antipsychotic, hypnotic and anxiolytic drugs) and N06 (antidepressant, psychostimulant, psychoanaleptic and psychodysleptic drugs). In this study, we looked into the new psychoactive drug consumers. We defined two categories of psychoactive drug users according to their consumption during the follow-up (Figure 1): (1) non-consumers (no psychoactive drug consumption in 1996, 1999 and 2001) and (2) new consumers (psychoactive drug consumption in 1999 and 2001 or only in 2001 but not in 1996).

### Statistical analysis

Data analyses were conducted using SAS statistical software<sup>®</sup>. We performed analyses in the whole population sample and separately for each gender.

All variables included in the analysis were defined from data collected at the baseline.

A descriptive analysis investigated sociodemographic and professional characteristics as well as the health status of the study sample. Pearson's chi-squared test for categorical variables (with a significance level of  $p < 0.05$ ) was used to examine bivariate associations between non-consumers and new consumers.

We performed a multivariate logistic regression analysis using a backward selection (with 0.10 significance level) to investigate factors related with a psychoactive drug initiation. Odds ratios (OR) are presented in tables with their 95% confidence intervals (CI). We evaluated the goodness-of-fit with the Hosmer–Lemeshow test. Separate analyses were performed for men and women.

## RESULTS

### Characteristics of the sample

Main characteristics of participants are shown in Table 1. A total of 1533 subjects were included in our

Table 1. Characteristics of study population at the date of inclusion (1996)

	All sample <i>n</i> = 1533 (%)	Men <i>n</i> = 772 (50.5%)	Women <i>n</i> = 764 (49.6%)
Age group			
32 Years	490 (32.0)	230 (29.8)	260 (34.2)
42 Years	533 (34.8)	280 (36.3)	253 (33.3)
52 Years	510 (33.3)	262 (34.0)	248 (32.6)
Marital status			
Separated (widowed, divorced)	194 (12.7)	66 (8.5)	128 (16.9)***
Health status			
Depression	151 (9.9)	34 (4.4)	117 (15.4)***
Sick leave	424 (27.7)	176 (22.8)	248 (32.6)***
High perceived stress	380 (24.8)	147 (19.0)	233 (30.6)***
Low energy <sup>§</sup>	201 (13.1)	68 (8.8)	133 (17.5)***
High emotional reactions <sup>§</sup>	108 (7.1)	37 (4.8)	71 (9.3)**
High social isolation <sup>§</sup>	39 (2.5)	14 (1.8)	25 (3.3)
Occupational group			
Executives/managers	172 (11.5)	132 (17.6)	40 (5.4)***
Technicians/supervisors	470 (31.4)	258 (34.3)	212 (28.5)*
White-collar	549 (36.7)	125 (16.6)	424 (57.0)***
Blue-collar	305 (20.4)	237 (31.5)	68 (9.1)***
Occupational characteristics			
Low job control-reward <sup>#</sup>	317 (20.7)	126 (16.3)	191 (25.1)***
High physical strain <sup>#</sup>	321 (20.9)	145 (18.8)	176 (23.1)*
High psychological demand <sup>#</sup>	221 (14.4)	117 (15.2)	104 (13.7)
Perceived job insecurity	228 (14.9)	125 (16.2)	103 (13.6)
Alcohol daily	400 (26.1)	296 (38.3)	104 (13.7)***
Current smoker	482 (31.4)	272 (35.2)	210 (27.6)**
Psychoactive drug consumption <sup>†</sup>			
1996	164 (10.7)	64 (8.3)	100 (13.1)**
1999	128 (8.4)	39 (5.1)	89 (11.7)***
2001	142 (9.3)	49 (6.4)	93 (12.2)***

\**p* < 0.05; \*\**p* < 0.001; \*\*\**p* < 0.0001.

<sup>§</sup>Nottingham Health Profile's dimensions.

<sup>#</sup>Job stressors factors.<sup>22</sup>

<sup>†</sup>In 1996 survey: psychoactive drug use during the previous three months.

In 1999 and 2001 surveys: psychoactive drug use during the previous month.

study with 772 men (50.5%) and 764 women (49.6%). Men and women differed in many sociodemographic and occupational factors: women were significantly more often separated (widowed or divorced) than men (16.9% versus 8.5%, *p* < 0.0001), more often reactively depressed (15.4% versus 4.4%, *p* < 0.0001), had more frequent periods of sick leave during the previous year (32.6% versus 22.8%, *p* < 0.0001), perceived lower energy (17.5% versus 8.8%, *p* < 0.0001), lower emotional reactions (9.3% versus 4.8%, *p* < 0.001) and, on the contrary, higher stress (30.6% versus 19.0%, *p* < 0.0001) than men. With regard to professional characteristics, women were more likely to hold down a job with low control and reward (25.1% versus 16.3%, *p* < 0.0001) and high PS (23.1% versus 18.8%, *p* < 0.05). In our sample, 14.9% of subjects were afraid to lose their job in the future without gender difference.

Prevalence of psychoactive substance use differed significantly by gender. Daily alcohol consumers and smokers were found more often in men (38.3% versus 13.7% in women, respectively, *p* < 0.0001 and 35.2% versus 27.6%, *p* < 0.001). In 1996, 10.7% of workers declared to have consumed at least one psychoactive drug during the previous 3 months corresponding to 13.1% of women and 8.3% of men (*p* < 0.01).

#### Prevalence of new psychoactive drug use during the follow-up

Table 2 presents the prevalence of new consumption among workers according to psychoactive drug classes: 5.4% of participants began consuming psychoactive drugs during the follow-up with a twofold difference in favour of women (7.5% versus 3.4%, *p* < 0.001). The prevalence of new use was very similar for the different

PSYCHOACTIVE DRUG INITIATION

Table 2. Percentage of new consumers by psychoactive drug classes according to gender, age group and occupational group

	New consumers				
	<i>n</i>	Psychoactive drug <i>n</i> = 83 <sup>§</sup> (5.4%)	Anxiolytic <i>n</i> = 43 (2.8%)	Hypnotic <i>n</i> = 35 (2.3%)	Antidepressant <i>n</i> = 36 (2.3%)
Gender					
Men	772	26 (3.4)	15 (1.9)	11 (1.4)	10 (1.3)
Women	764	57 (7.5)**	28 (3.7)*	24 (3.1)*	26 (3.4)*
Age group					
32 Years	490	17 (3.5)	8 (1.6)	6 (1.2)	6 (1.2)
42 Years	533	29 (5.4)	18 (3.4)	12 (2.3)	14 (2.6)
52 Years	510	37 (7.3)*	17 (3.3)	17 (3.3)	16 (3.1)
Occupational group					
Executives/managers	172	10 (5.8)	5 (2.9)	4 (2.3)	3 (1.7)
Technicians/supervisors	470	18 (3.8)	11 (2.3)	7 (1.5)	7 (1.5)
White-collar	549	39 (7.1)	20 (3.6)	17 (3.1)	17 (3.1)
Blue-collar	305	14 (4.6)	5 (1.6)	5 (1.6)	7 (2.3)

\**p* < 0.05; \*\**p* < 0.001.

<sup>§</sup>Sum does not equal 100% because a subject may initiate the use of several psychoactive drugs at the same time.

classes of drugs, with a higher use in women: anxiolytics (3.7% in women *versus* 1.9% in men), hypnotics (3.1% *versus* 1.4%), antidepressants (3.4% *versus* 1.3%). The rate of new consumers was higher in the 52-year group (7.3% *versus* 3.5% in the 32-year group and 5.4% in the 42-year group), and seems higher among white-collar, with 7.1% of new users, even though there was no statistical difference between professional categories.

*Comparison of new psychoactive drug consumers and non-consumers*

Table 3 compares characteristics of new psychoactive drug consumers to non-consumers during the 5-year follow-up. We observed significant differences between these groups: subjects who initiated consumption were older (44.6% in 52 years *versus* 20.5% in 32 years, *p* < 0.01), more frequently separated (25.3% *versus* 10.9%, *p* < 0.0001), more frequently depressed (24.1% *versus* 5.9%, *p* < 0.0001) and presented higher perceived stress score (38.6% *versus* 20.3%, *p* < 0.0001) compared to non-consumers. They presented low energy levels more frequently (18.1% *versus* 10.0%, *p* < 0.05), impaired emotional reactions (13.3% *versus* 4.7%, *p* < 0.01) and high social isolation (6.0% *versus* 1.9%, *p* < 0.05). As for occupational characteristics, there were more white-collar than in the non-consumers group (48.2% *versus* 34.8%, *p* < 0.05) and more frequent imbalance between job control and reward (36.1% *versus*

18.8%, *p* < 0.001) in the new consumer group than in non-consumer groups. In contrast, we did not find any difference between groups concerning the perception of job insecurity.

*Factors associated with a psychoactive drug initiation among workers*

Results of the multivariate analysis are presented in Table 4. All variables with *p* < 0.05 at the time of the comparison of new psychoactive drug consumers and non-consumers were included as possible confounding factors: age-group, gender (for the first model), marital status, occupational group, Nottingham Health Profile's dimensions (to evaluate general health status), perceived high stress and also variables coding for job stressors (JC-R, PD, PS). Depression was not included because there was a high correlation between this variable and the variables coding for the three dimensions of the Nottingham Health Profile. The first model investigates factors related to psychoactive drug initiation among all workers. The variables remaining in the first model were female gender (OR = 2.19 [1.34–3.58], *p* < 0.01), age 52 years and over (OR = 1.99 [1.07–3.69], *p* < 0.05), separated status (OR = 1.85 [1.06–3.24], *p* < 0.05), high perceived stress (OR = 1.93 [1.19–3.12], *p* < 0.05) and low JC-R ratio (OR = 1.97 [1.21–3.20], *p* < 0.01).

Secondly, we performed two models to identify the specific factors depending on gender. The factors

Table 3. Compared characteristics of new consumers and non-consumers of psychoactive drugs (205 consumers not presented because they were not new consumers)

	Non-consumers <i>n</i> = 1245	New consumers <i>n</i> = 83	<i>p</i> -Value
Gender			
Women	573 (46.0)	57 (68.7)	<0.0001
Men	672 (54.0)	26 (31.3)	<0.0001
Age group			
32 Years	417 (33.5)	17 (20.5)	0.01
42 Years	444 (35.7)	29 (34.9)	0.89
52 Years	384 (30.9)	37 (44.6)	0.22
Marital status			
Separated (widowed, divorced)	135 (10.9)	21 (25.3)	<0.0001
Health status			
Depression	74 (5.9)	20 (24.1)	<0.0001
Sick leave	312 (25.1)	26 (31.3)	0.20
High perceived stress	253 (20.3)	32 (38.6)	<0.0001
Low energy	125 (10.0)	15 (18.1)	0.02
High emotional reactions	59 (4.7)	11 (13.3)	0.002
High social isolation	23 (1.9)	5 (6.0)	0.03
Occupational group			
Executives/managers	139 (11.5)	10 (12.3)	0.88
Technicians/supervisors	394 (32.5)	18 (22.2)	0.06
White-collar	422 (34.8)	39 (48.2)	0.01
Blue-collar	259 (21.3)	14 (17.3)	0.39
Occupational characteristics			
Low job control-reward	234 (18.8)	30 (36.1)	<0.001
High physical strain	256 (20.6)	20 (24.1)	0.44
High psychological demand	173 (13.9)	10 (12.1)	0.64
Perceived job insecurity	183 (14.7)	11 (13.4)	0.75
Alcohol daily	332 (26.7)	21 (25.3)	0.79
Current smoker	401 (32.2)	19 (22.9)	0.08

related to psychoactive drug initiation were different between men and women. In men, the factors observed in the statistical model included the separated status (OR = 3.74 [1.35–10.35],  $p < 0.01$ ), high emotional reactions (OR = 9.17 [3.14–26.74],  $p < 0.0001$ ) and belonging to the white-collar group (OR = 2.81 [1.12–7.06],  $p < 0.05$ ). We did not find any occupational factors implied in psychoactive drug initiation. In women, drug initiation was more frequent among the 52 years and over group (OR = 2.59 [1.26–5.31],  $p < 0.05$ ), especially when JC-R ratio was low (OR = 2.03 [1.14–3.68],  $p < 0.05$ ).

## DISCUSSION

The main aim of our study was to identify which psychosocial factors at work were associated with psychoactive medication initiation among healthy

workers. We identified 5.4% of workers who had begun psychoactive drug use during the 5-year follow-up with a higher prevalence in women (7.5%) than in men (3.4%). To the best of our knowledge, few studies have attempted to investigate the relation between initiating psychoactive medication use and working conditions.<sup>10–13</sup> Most previous studies were interested in factors associated with a current use. In our sample, 10.7% of workers reported to consume a psychoactive drug at baseline, with a higher prevalence among women. Our findings are in agreement with those of studies in the general population where women appeared to be heavier consumers than men for all drugs but especially for psychoactive medications.<sup>1–4</sup> However, we observed a prevalence of psychotropic drug use that was lower in workers than in the French general population,<sup>4</sup> which could be explained by the 'healthy worker effect'.

The workplace represents an interesting environment because subjects are exposed to particular conditions. Many authors have focussed on the impact of organizational and psychosocial constraints in workplace on health<sup>17,18,27–30</sup> and several job stressors have been defined. The most frequently used methods for assessing the stress at work are Karasek's Job Demand-Control model and Siegrist's Effort-Reward Imbalance model. A recent study using data from the VISAT cohort<sup>26</sup> (which did not include all the questions of these models because they were not validated at the time of the VISAT construction in the early 90s) defined three categories of job stressors from 59 questions by using a principal component analysis: job control and reward, PS and PD. The analysis gave the same results whatever the occupational class. Through this method, we obtained three factors comparable to several dimensions of Karasek's or Siegrist's models. Social support was included in the psychological dimension and was not evaluated independently like in Karasek's model. This method allowed us to identify workers exposed to occupational constraints.

Several factors were identified as related to psychoactive drug use initiation in our study. Firstly, initiation of use was associated with demographic (female gender, old age and separated status) and high perceived stress. We also found an association with one occupational dimension: lack of job control and reward. This suggests that workers with low decision latitude associated with a low level of reward would be more disposed to initiate psychoactive drug consumption. This new consumption may be a consequence of stress. In recent years, several studies have been conducted to evaluate the impact of working conditions on health and more specifically on mental health.<sup>27–33</sup>

PSYCHOACTIVE DRUG INITIATION

Table 4. Multivariate logistic regression analysis according to gender (odds ratio [OR] with their confidence interval [CI])<sup>†</sup>

Logistic regression* (reference non-consumers)	All samples n = 83		Men n = 26		Women n = 57	
	OR	(95%CI)	OR	(95%CI)	OR	(95%CI)
Gender						
Men	1					
Women	2.19*	1.34–3.58				
Age						
32 Years	1		1		1	
42 Years	1.46	0.78–2.74	—		1.75	0.83–3.72
52 Years	1.99*	1.07–3.69	—		2.59*	1.26–5.31
Marital status						
Married/single	1		1		1	
Separated (widowed, divorced)	1.85*	1.06–3.24	3.74**	1.35–10.35	—	
Occupational group						
Technicians/supervisors	1		1		1	
Executives/managers	—		1.49	0.43–5.17	—	
White-collar	—		2.81*	0.94–8.43	—	
Blue-collar	—		0.81	0.24–2.77	—	
Emotional reactions						
Normal	1		1		1	
High	—		9.17***	3.14–26.74	—	
Perceived stress						
Normal	1		1		1	
High	1.93*	1.19–3.12	—		—	
Job control-reward						
Normal	1		1		1	
Low	1.97*	1.21–3.20	—		2.03*	1.14–3.61

<sup>†</sup>Adjustment on: age-group, gender (for the general model), marital status, occupational group, Nottingham Health Profile's dimensions, perceived high stress, job control-reward, physical strain, psychological demand.

\*p < 0.05, \*\*p < 0.001, \*\*\*p < 0.0001.

A European study has positioned 'stress' as the first occupational health problem in Europe after back pain, musculoskeletal disorders and tiredness. Actually, 20% of European workers reported to suffer from health problems related to stress at work.<sup>34</sup> Currently, the problem is found in all sectors of activity. Stressful job conditions appear when workers feel that there is an imbalance between what they are asked to do and the resources available. Job stress can be either physical or psychological.<sup>35</sup> A prolonged stress is harmful to the health of workers and could be responsible for mental disorders.<sup>27,29–32,36,37</sup> Workers must adapt themselves to these stressful conditions which can make their work difficult. Yet, a recent study<sup>6</sup> underlined the impact of psychosocial work stress on psychoactive drug consumption. More than half of workers suffering from occupational stress had presented sleep disorders during the previous week, 5.6% reported having had suicidal thoughts and 8.6% had suffered a depressive episode during the year.<sup>19</sup> Niedhammer *et al.*<sup>38</sup> also underlined that low decision latitude, low social support and high PD in workplace were responsible for the emergence of depressive symptoms in the GAZEL cohort. But this new consumption may also reveal a doping behaviour to stay in good form at work

or relax after a hard day's work. Moreover, women seem more exposed to this behaviour than men.<sup>22</sup> To confront stressful conditions, some workers eat more than usual and other use psychoactive substances such as tobacco, alcohol, psychoactive drugs or illegal substances. In our study we included anxiolytics and hypnotics. These drugs can be considered as doping substances because workers subjected to psychosocial work stress need to recover after their day's work. Recovery is often difficult because sleep disorders are generally associated with psychosocial work stress. Taking anxiolytics or hypnotics allows workers to recover faster and better. This behaviour should be considered as a doping behaviour. Many studies raise the question of involvement of perceived job insecurity in workers' mental health. Rugulies *et al.*<sup>31</sup> identified job insecurity as predictive of severe depressive symptoms among men. In fact, the reorganization of work has changed employment patterns and revealed job insecurity problems. Consequences of this insecurity on psychological and physical morbidity, mortality or sickness absence have been thoroughly studied. Several authors consider job insecurity as a chronic stressor responsible for the increase in psychological morbidity and musculoskeletal dis-

orders.<sup>17</sup> Unlike other studies,<sup>30</sup> we did not find that this factor was associated with psychoactive drug use initiation in either gender. However, job insecurity was evaluated with different questions. Rugulies *et al.* identified workers with 'job insecurity' if they were worried about becoming unemployed, being transferred to another job against their will, redundancy as a result of a new technology or having difficulty to find another job in case of unemployment. In our study, we evaluated workers with job insecurity only through the issue of the fear of losing their job in the future. The lack of association with psychoactive drug use initiation may be due to our definition which is not precise enough to evaluate job insecurity problems.

Secondly, we identified a different pattern of associations for men and women. This is a very interesting result, which underlines the importance of separate gender analyses when studying psychoactive drug consumption. Factors associated with a psychoactive drug initiation in men were mainly emotional factors: separation from their wife (widower or divorced), high emotional reactions. Neither working conditions nor age were associated with starting consumption. Several studies identified that widows, widowers and divorced subjects tended to use more psychoactive drugs than single or married subjects.<sup>39</sup> Appelberg *et al.*<sup>40</sup> underlined that the use of tranquilizers and hypnotics was associated with a recent interpersonal conflict at work but only among men. In women, factors associated to psychoactive drug use initiation were remarkably different. They included primarily age. The OR increased with age, reaching 2.59 in women aged 52 and over. Previous studies on psychoactive drug consumption had already shown that age represented a risk factor only for women.<sup>10</sup> We can suppose that age is a stress factor greater among women as they initiate psychoactive drug consumption with age. In our study, we found another factor associated with use initiation among women: lack of job control and reward. So, we underlined that decision latitude but also work reward seemed to be a more essential factor for women's mental stability. These findings are surprising compared with data from the literature because in the present study job stressors were more important in women and psychological factors were risk factors more important in men. In fact, Empereur *et al.*<sup>10</sup> found that occupational factors explained an increase in psychoactive drug use in men aged 50 and over. Psychosocial work stressors could be responsible for mental disorders<sup>33,41</sup> and a low job control associated with high demand in the Karasek's model could be responsible for health problems. A longitudinal study<sup>29</sup>

showed that in both genders, high job demand and low social support at work were predictive of increased depressive symptoms. Moreover, Godin *et al.*<sup>30</sup> reported that cumulative job stress had strongest effects on mental health in women.

Working conditions influence the risk for initiating psychoactive drug consumption, especially in women. But, despite this evidence, the study suffers from several limitations. Firstly, our data are based on psychoactive drug utilization and not on the evaluation of mental health. Many studies have shown that women used more psychoactive drugs than men. In our study, only 26 men initiated psychoactive drug consumption during the follow-up. We must interpret our results with great caution because the statistical power may be too low to observe an association with working conditions among men. But, it is also reported that men could use other substances to face work constraints such as alcohol, tobacco, etc.<sup>22</sup> Secondly, as in all studies evaluating the relationship between health and working conditions, a selection bias is possible. There is a self-selection of workers that excluded, for example, those exposed to the most stressful conditions or those suffering from a serious psychiatric disorder. This selection leads to a 'healthy worker effect' that may be responsible for the underestimation of psychoactive drug use and for the relation between drug consumption and working conditions. Moreover, subjects who perceived high stress (but non-consumers at inclusion) may have been lost during follow-up when they began a psychoactive drug consumption, which leads again to an underestimation of the effect. Comparison of baseline characteristics of included and not included subjects (data not shown) showed that included subjects were younger, less often separated, consumed less alcohol or psychoactive drugs and presented higher job insecurity than not included. We did not observe any difference regarding the other variables analysed in the study. Thirdly, we have an information bias. On the one hand, as in most studies on drug utilization, we evaluated drug exposition with a questionnaire. We asked the workers to report all the medications used during the month preceding the survey. Therefore, we have a possible recall bias. This bias is all the more important because we analysed psychoactive drug use which, by definition, affects cognitive functions such as memory. Moreover, these studies are particularly difficult to realize among workers which are subject to a competitive environment. Workers are reluctant to admit their mental health problem, hence an under-reporting of psychoactive drugs consumed in this population. On the other hand, we evaluated drug consumption with a different method in 1996 compared with the following

interviews in 1999 and 2001. Moreover, we could hypothesize that this approach did not alter results because we identified a similar number of new consumers if we used only data between 1996 and 1999 (4.5%) or between 1999 and 2001 (5.0%). Data from 1996 were included to get baseline characteristics of workers and to have a sufficient number of people for the analysis (see Figure 1). The information on psychoactive drug consumption was different between 1996 and 1999–2001. However, the way to collect them was similar (subjects were interviewed by their occupational physician to report drug use for depression, anxiety or sleep disorders in 1996 and to report drug names in 1999–2001). Even if these data collections were very different, we estimated that it was not a problem. Actually, it is highly probable that we overestimated psychoactive drug users in 1996. Thus, these potential users were not included in the analysis comparing baseline characteristics of non-users (who never reported any use), as well as by means of a question about depression severity, sleep disorders, than by means of reporting names of consumed medications. Finally, we did not really assess constraints at work but rather subjects' perception of their workplace environment.

## CONCLUSION

Psychoactive drug initiation concerned 5.4% of workers. The pressure of psychosocial environment (mainly social relationships) was more important in men, whereas age and psychosocial work stress were the main factors associated to new consumption in women. In this study, we underlined a relationship between psychosocial work stress and the initiation of medical treatment or a self-medicated psychoactive drug use especially among women.

### KEY POINTS

- Few studies have investigated the factors involved in initiating psychoactive drug use.
- Psychoactive drug initiation concerned 5.4% of workers in the VISAT cohort study.
- Factors associated with psychoactive drug initiation were different according to gender.
- In men, factors associated were mainly emotional factors. No professional factor was associated with starting consumption. In women, psychoactive drug initiation was related with the age and the lack of job control and reward.

## ACKNOWLEDGEMENTS

This study has received support from MILDT/AFSSAPS (Mission Interministerielle de la Lutte contre la Drogue et la Toxicomanie/Agence Française de Sécurité Sanitaire des Produits de Santé) and from the French Research Agency (ANR: Agence Nationale de la Recherche)—Agreement 06 SEST 041. This study has been already presented as an oral communication at the 24th International Conference on Pharmacoepidemiology and Therapeutic Risk Management (Copenhagen, 17–20 August 2008). Abstract in *Pharmacoe-pidemiol Drug Saf* 2008; **17**: S1–S294. This study will be presented in the 13th Congress of the French Society of Pharmacology (Marseille, 15–17 April 2009).

## REFERENCES

1. Ohayon MM, Lader MH. Use of psychotropic medication in the general population of France, Germany, Italy, and the United Kingdom. *J Clin Psychiatry* 2002; **63**: 817–825.
2. Ohayon MM, Caulet M, Priest RG, *et al.* Psychotropic medication consumption patterns in the UK general population. *J Clin Epidemiol* 1998; **51**: 273–283.
3. Lecadet J, Vidal P, Baris B, *et al.* Médicaments psychotropes: consommation et pratiques de prescription en France métropolitaine. I. Données nationales, 2000. *Revue Médicale de l'Assurance Maladie* 2003; **34**: avril-juin.
4. Alonso J, Angermeyer MC, Bernert S, *et al.* Psychotropic drug utilization in Europe: results from the European Study of the Epidemiology of Mental Disorders (ESEMeD) project. *Acta Psychiatr Scand* 2004; **109**: 55–64.
5. Clerc ME, Pereira C, Podevin M, *et al.* Le marché du médicament dans cinq pays européens, structure et évolution en 2004. *Etudes et résultats DREES* 2006; **502**: 1–8.
6. Boeuf-Cazou O, Lapeyre-Mestre M, Niezborala M, *et al.* Evolution of drug consumption in a sample of French workers since 1986: the “Drugs and Work” study. *Pharmacoe-pidemiol Drug Saf* 2009; early view.
7. Lepine JP, Gasquet I, Nordmann R, *et al.* Usage des psychotropes en France: évolution temporelle et comparaison avec les pays européens proches. *Bulletin de l'Académie Nationale de Médecine* 2006; **190**: 1139–1145.
8. Durand E. Médicaments psychotropes et travail: Médicaments antidépresseurs. *Documents pour le médecin du travail* 2007; **112**: 487–508.
9. Briot M. Rapport sur le bon usage des médicaments psychotropes. Assemblée nationale 3187, Sénat 422. Paris: Assemblée Nationale, la boutique de l'Assemblée, 2006; 501 p.
10. Empereur F, Baumann M, Alla F, *et al.* Factors associated with the consumption of psychotropic drugs in a cohort of men and women aged 50 and over. *J Clin Pharm Ther* 2003; **28**: 61–68.
11. Pariente P, Lépine JP, Lellouch J. Self-reported psychotropic drug use and associated factors in a French community sample. *Psychol Med* 1992; **22**: 181–190.
12. Dealberto MJ, Seeman T, McAvay GJ, *et al.* Factors related to current and subsequent psychotropic drug use in an elderly cohort. *J Clin Epidemiol* 1997; **50**: 357–364.
13. Virtanen M, Honkonen T, Kivimäki M, *et al.* Work stress, mental health and antidepressant medication findings from the Health 2000 study. *J Affect Disord* 2007; **98**: 189–197.
14. Gowing MK, Kraft JD, Campbell Quick J. *The New Organizational Reality: Downsizing, Restructuring, and Revitalization*. American Psychological Association: Washington, DC, 1998.
15. Hurrell JJ. Editorial. *Am J Public Health* 1998; **88**: 1012–1013.
16. Green F, McIntosh S. The intensification of work in Europe. *Labour Econ* 2001; **8**: 291–308.
17. Kivimäki M, Vahtera J, Pentti J, *et al.* Factors underlying the effect of organisational downsizing on health of employees: a longitudinal cohort study. *Br Med J* 2000; **320**: 971–975.

18. Ferrie JE. Is job insecurity harmful to health? *J R Soc Med* 2001; **94**: 71–74.
19. Beck F, Gautier A, Guilbert P. Baromètre santé 2005: attitudes et comportements de santé. Saint-Denis: INPES, coll. Baromètres santé, 2007; 608 p.
20. Jacquinet-Salord MC, Lang T, Fouriaud C, et al. Sleeping tablet consumption, self reported quality of sleep, and working conditions. *J Epidemiol Community Health* 1993; **47**: 64–68.
21. Moisan J, Bourbonnais R, Brisson C, et al. Job strain and psychotropic drug use among white-collar workers. *Work Stress* 1999; **13**: 289–298.
22. Lapeyre-Mestre M, Sulem P, Niezborala M, et al. Conduite dopante en milieu professionnel: étude auprès d'un échantillon de 2106 travailleurs de la région toulousaine. *Thérapie* 2004; **59**: 615–623.
23. Marquie JC, Jansou P, Baracat B, et al. Aging, health, work: overview and methodology of the VISAT prospective study. *Le Travail Humain* 2002; **3**: 245–260.
24. Bucquet D, Condon S, Ritchie K. The French version of the Nottingham health profile. A comparison of items weights with those of the source version. *Soc Sci Med* 1990; **30**: 829–835.
25. Cohen S, Kamarack T, Mermerstein R. A global measure of perceived stress. *J Health Soc Behav* 1983; **24**: 385–396.
26. Niezborala M, Marquié JC, Baracat B, et al. Job stress, and occupational status in a French cohort. *Revue d'Épidémiologie et de Santé Publique* 2003; **51**: 607–616.
27. Estryng-Behar M, Kaminski M, Peigne E, et al. Stress at work and mental health status among female hospital workers. *Br J Ind Med* 1990; **47**: 20–28.
28. Kivimäki M, Elovainio M, Vahtera J, et al. Association between organizational inequity and incidence of psychiatric disorders in female employees. *Psychol Med* 2003; **33**: 319–326.
29. Paterniti S, Niedhammer I, Lang T, et al. Psychosocial factors at work, personality traits and depressive symptoms: longitudinal results from the GAZEL study. *Br J Psychiatry* 2002; **181**: 111–117.
30. Godin I, Kittel F, Coppieters Y, et al. A prospective study of cumulative job stress in relation to mental health. *BMC Public Health* 2005; **5**: 67–77.
31. Rugulies R, Bültmann U, Aust B, et al. Psychosocial work environment and incidence of severe depressive symptoms: prospective findings from a 5-year follow-up of the Danish Work Environment Cohort study. *Am J Epidemiol* 2006; **163**: 877–887.
32. Ylipaavalniemi J, Kivimäki M, Elovainio M, et al. Psychosocial work characteristics and incidence of newly diagnosed depression: a prospective cohort study of three different models. *Soc Sci Med* 2005; **61**: 111–122.
33. Stansfeld SA, Fuhrer R, Shipley MJ, et al. Work characteristics predict psychiatric morbidity: prospective results from the Whitehall II study. *Occup Environ Med* 1999; **56**: 302–307.
34. Fourth European working conditions survey, 2007 [online]. Available from URL: <http://www.eurofound.europa.eu/pubdocs/2006/98/en/2/ef0698en.pdf> [accessed 4 March 2009].
35. Enquêtes SUMER 2003 et Conditions de Travail. 2005, Ministère chargé du Travail [online]. Available from URL: [http://www.inrs.fr/html/une\\_analyse\\_conditions\\_travail\\_dans\\_population.html](http://www.inrs.fr/html/une_analyse_conditions_travail_dans_population.html) [accessed 4 March 2009].
36. Wang J. Work stress as a risk factor for major depressive episode(s). *Psychol Med* 2005; **5**: 865–871.
37. Watts DW, Short AP. Teacher drug use: a response to occupational stress. *J Drug Educ* 1990; **20**: 47–65.
38. Niedhammer I, David S, Bugel I, et al. Catégorie socioprofessionnelle et exposition aux facteurs psychosociaux au travail dans une cohorte professionnelle. *Travailler* 2001/1; **5**: 23–45.
39. Swartz M, Trinkoff AM, Anthony JC. Gender differences in initiation of psychotherapeutic medicine use. *Acta Psychiatr Scand* 1990; **81**: 32–38.
40. Appelberg K, Romanov K, Honkasalo ML, et al. The use of tranquilizers, hypnotics and analgesics among 18 592 Finnish adults: associations with recent interpersonal conflicts at work or with a spouse. *J Clin Epidemiol* 1993; **46**: 1315–1322.
41. Wall TD, Bolden RI, Borrill CS, et al. Minor psychiatric disorders in NHS trust staff: occupational and gender differences. *Br J Psychiatry* 1997; **171**: 519–523.