



## Brief report

# Self-reported major depressive symptoms at baseline impact abstinence prognosis in smoking cessation program. A one-year prospective study



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## ABSTRACT

**Objective:** The association between major depressive symptoms and smoking has been extensively documented. However, previous studies report conflicting findings about the impact of depression on lapse of smoking cessation. We hypothesize that smokers with self-reported major depressive symptoms at baseline are at higher risk of a lapse.

**Methods:** One thousand and twenty participants aged, 18 years and over, were recruited in a smoking-cessation unit. All participants were assessed for their smoking status six times during one year of follow-up. Participants were classified as “euthymic”, presenting “minor depressive symptomatology” or “major depressive symptomatology” according to their baseline score on the Hospitalization Anxiety and Depression Scale.

**Results:** Using Cox's proportional hazard regression modeling, adjusted for potential confounding factors (nicotine dependence, number of cigarettes/day, previous cessation attempt, alcohol misuse, socio-demographic variables), it was shown that lapse is associated with major depressive symptoms (Hazard Ratio: HR=1.23 [1.02;1.47];  $p=0.03$ ).

**Conclusion:** Our results suggest the importance for clinicians to deal with depression and to discriminate minor from major depressive symptoms at preliminary smoking cessation consultations.

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## 1. Introduction

A depressive mood is often considered a reason to preclude smoking cessation, given that smokers are afraid of stopping smoking and worsening their depressive mood. It is also often admitted that a depressive mood is an obstacle to ceasing tobacco use. However, previous studies report conflicting findings on the relationship between depression and smoking cessation lapses. Independent meta-analyses based on surveys done between 1988 and 2000 suggest that a past history of depression is not a risk factor for a relapse in smoking (Gierisch et al., 2010; Hitsman et al., 2003; John et al., 2004), whereas another report, which presented an update of the Hitsman et al. (2003) meta-analysis,

suggests that it could be a risk factor for long-term relapses (more than 6 months) (Ziedonis et al., 2008). Some studies suggest that a current depression may be specifically associated with lower smoking abstinence rate (Anda et al., 1990; Berlin and Covey, 2006; Japuntich et al., 2007; Juliano et al., 2006; Ziedonis et al., 2008), others suggest the opposite (Munoz et al., 1997; Thorsteinsson et al., 2001). A further article finds an association between lower smoking abstinence rate and other variables, such as gender, marital status, or employment status (Kinnunen et al., 2008). A potential explanation for these discrepancies could be that most studies are based on clinical trials or on institutionalized subjects and a major depressive episode is often a standard exclusion criteria in clinical trials (Hitsman et al., 2003). The extrapolation of the impact of depression on smoking abstinence in the general population has not been explored.

The present study was designed to measure the impact of concurrent major depressive symptomatology at first consultation on smoking abstinence in a non-selected population of 1020

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French smokers who were receiving counseling for tobacco cessation. We hypothesized that smokers who present major depressive symptoms at the time they quit smoking have a higher lapse of smoking-cessation rate independently of other confounding factors.

## 2. Methods

### 2.1. Study population

One thousand and twenty non-institutionalized participants, over 18 years of age, were recruited from the smoking-cessation unit at the Montpellier Academic Hospital (France). This population is a representative of the population who need support to quit smoking as in France smoking cessation units are almost exclusively located in hospitals.

### 2.2. Process

People were addressed by their General Practitioner or came directly to the hospital. Hospitalized patients were excluded. This procedure is the usual clinical follow-up in the department. Use of these data for research purposes has been approved by a local ethics committee. Subjects were seen at baseline on the quit day by a MD (X.Q) and were given self-reported questionnaires. Subjects were all current regular cigarette smokers (no cigars or pipe smokers), and were asked about their quitting history. As we aimed to carry out a «real life» ecological study, participants were included even if they were currently on psychiatric medication. There was no criterion specifying that they should be stabilized for a period of time.

Follow-up visits were scheduled at 7, 14, 30, 60, 180, and 365 days after the quitting day. Smoking status was obtained by consultations or by phoning. During these visits or phone calls, participants reported any cigarettes they had smoked.

### 2.3. Variables definition

#### 2.3.1. Clinical variables

**Lapse:** Lapse is the first smoked cigarette after tobacco cessation. None-daily smokers were considered as lapsers. Consumption of only one cigarette a day was considered as a lapse, as smoking only one cigarette is highly predictive of relapse (Juliano et al., 2006; Shiffman et al., 2006; Tonstad et al., 2006), which may be defined by smoking for seven consecutive days or five cigarettes/day for three consecutive days (Shiffman et al., 2006). Choosing a universal criterion of lapse was difficult given that literature does not propose any consensus on this issue (Catz et al., 2011; Japuntich et al., 2011; Swan et al., 2010). We chose a strict criterion that was demonstrated to be highly predictive of relapse (Nides et al., 1995).

Like the most part of other studies, self-reporting of abstinence was considered valid without needing an objective measurement from expired carbon monoxide (Studts et al., 2006). In cases of lapse, the day of lapse was defined as the day after cessation on which daily consumption began (Shiffman et al., 2006). Lapsers were dropped out after lapsing.

To limit loss to follow-up, monitoring was conducted with great perseverance. Actually we had only nine of 1020 (0.08%) lost-of-follow up who were considered lapsers the day following news was last obtained by phone call (we carried out an intent-to-treat analysis).

**Self-reported depressive symptomatology:** The Hospitalization Anxiety and Depression Scale (HADS) is an established self-report measure of both the frequency and the severity of depression and anxiety, and consists of 14 questions about mood and anxiety, in

which a participant can answer on a scale of 0–3 (Zigmond and Snaith, 1983). The responses are added-up to obtain a depression score ranging from 0 to 42. We calculated the anxiety sub-score too (considered as “positive” if the score on anxiety items was  $\geq 8$ ). Participants scoring 19 and higher on HADS are classified as presenting “with major depressive symptomatology” (sensitivity 70%, specificity 75%) (Lepine et al., 1985; Zigmond and Snaith, 1983). HADS has been found to perform well in assessing the symptom severity of anxiety disorders and depression in both somatic, psychiatric, and primary-care patients and in the general population (Bjelland et al., 2002). More than 200 published studies from most medical settings worldwide have reported experiences with the Hospital Anxiety and Depression Scale (HADS) (Herrmann, 1997). The French version was chosen as it is recommended by the French Tobaccology Society’s guidelines for evaluation of depression among smokers (Le Foll et al., 2005).

**Level of nicotine (NIC) dependence** was assessed according to the Fagerström Test for Nicotine Dependence (FTND) (Heatherton et al., 1991) using the following cut off: very low to low dependence (FTND  $\leq 4$ ), medium dependence (5), or high to very high dependence (FTND  $\geq 6$ ) on nicotine.

**Diagnosis of alcohol misuse:** The CAGE questionnaire, the name of which is an acronym of its four questions, is a widely used method of screening for alcoholism. Patient with a score of at least 2 at the CAGE test (Beresford et al., 1990) was diagnosed as presenting “alcohol misuse”.

**Tobacco-cessation support** was chosen by both the MD and the patient at the preliminary consultation according to recommendations independently of the survey’s outcomes: all patients received consultations +/- pharmacological treatment. All type of supports were proposed to patients with information on each treatment, and the patient made his/her own decision about the cessation support he/she wanted, thus respecting the «real life» nature of our study. The consultations were as frequent as needed, mostly monthly except for the second visit which was 1 week after smoking cessation.

**Socio-demographic variables:** A baseline standardized pre-treatment preliminary interview included questions on demographic characteristics, education level, employment status, marital status, medical conditions, and smoking history.

### 2.4. Statistical analyses

To examine the relationship between depression and risk of lapse over the 1-year follow-up period, Cox proportional hazards regression models were performed. Cox proportional hazards regression models were carried out on variables found to have a  $p$  value  $\leq 0.1$  by univariate analysis. Results of proportional-hazards regression analyses were expressed as hazard ratios (HR) with 95% confidence intervals (CI). Significance level was set at  $p < 0.05$ . All statistical analyses were conducted using SPSS for Windows version PASW 17.03 (SPSS Inc., Chicago, 1999).

## 3. Results

### 3.1. Characteristics of participants at first consultation

Major depressive symptomatology was reported among 28.1% of patients (287) and our global lapse rate was 69.5% (709). Women represented 53.1% of patients (523), mean age was 43.3years (+/-10.9), mean age for first cigarette was 16.0 years (+/-3.7), the mean duration of smoking was 25.4 years (+/-10.5). High to very high (FTND  $\geq 6$ ) nicotine dependence was reported among 57.5% of patients (587) and current alcohol misuse among 17.5% (178).

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