

## Personality disorders and smoking in Spanish general and clinical population

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### Abstract

**Background:** There is consistent evidence about the relationship between smoking and mental health. This study compares the relationship between tobacco use and personality disorders (PDs) in Spanish adults from general and clinical population, taking into account nicotine dependence (ND), and the presence of any mental disorder. **Method:** The sample was made up of 1,079 smokers (519 from general population, 560 from clinical population). PDs were assessed by means of the International Personality Disorder Examination Questionnaire, Module DSM-IV. **Results:** Individuals seeking treatment to quit smoking had a higher likelihood of presenting a paranoid, schizoid, schizotypal, borderline, antisocial, and dependent PD compared to smokers from the general population. This likelihood was higher when ND was taken into account. Among smokers from the general population, ND was associated with a higher likelihood of presenting a borderline and dependent PD. **Conclusions:** A significant relationship between smoking and several PDs exist, especially in nicotine dependent smokers. Relevance of the findings regarding the influence of PDs in smoking cessation interventions is discussed.

**Keywords:** Personality disorders, smoking, tobacco.

### Resumen

**Trastornos de personalidad y consumo de tabaco en la población general y clínica española. Antecedentes:** existe evidencia sólida sobre la relación entre fumar y salud mental. Este estudio compara la relación entre consumo de tabaco y trastornos de personalidad (TP) en adultos españoles de población general y población clínica, teniendo en cuenta la dependencia de la nicotina (DN) y la presencia de algún trastorno mental. **Método:** la muestra estuvo formada por 1.079 fumadores (519 de población general, 560 de población clínica). Los TP se evaluaron con el cuestionario del International Personality Disorders Examination, Módulo DSM-IV. **Resultados:** los individuos que demandaron tratamiento para dejar de fumar tenían una mayor probabilidad de presentar un TP paranoide, esquizoide, esquizotípico, límite, antisocial y dependiente que los fumadores de población general. Esta probabilidad fue mayor cuando además existía DN. Entre los fumadores de población general, la DN se asoció con una mayor probabilidad de presentar un TP límite y dependiente. **Conclusiones:** existe una relación significativa entre consumo de tabaco y varios TP, especialmente en fumadores dependientes de la nicotina. Se comenta la relevancia de los hallazgos respecto a la influencia de los TP en las intervenciones para dejar de fumar.

**Palabras clave:** trastornos de personalidad, fumar, tabaco.

Although the association of smoking and some mental disorders (e.g., depressive disorders) has been increasingly recognized (Ziedonis et al., 2008), the relationship between personality disorders (PDs) and cigarette use has received less attention. Most of the studies were performed in smokers from the general population (individuals enrolled voluntarily in a research study but who were not seeking treatment) and few were carried out in clinical samples (individuals seeking treatment to quit smoking). This appreciation is important because there are some differences between smokers from both groups regarding demographics (age, gender, etc.) and smoking-related characteristics (including nicotine dependence, ND) (Hughes, Giovino, Klevens, & Fiore, 1997; Le Strat, Rehm, & Le Foll, 2011). Research indicated that

female, older age, more educated, and more nicotine-dependent smokers were more likely to attend treatments (pharmacological and non-pharmacological) to stop smoking (e.g., Kotz, Fidler, & West, 2009). It seems that smokers with high ND are more likely to seek treatment because of a greater risk of failure if they try to quit without treatment (e.g., Shiffman, Brockwell, Pillitteri, & Gitchell, 2008).

Regarding the relationship between PDs and smoking, previous research among smokers from the general population has reported important findings. First, this association appears to differ by specific PD, with some of the strongest relations being evident for antisocial (e.g., Becoña, Fernández del Río, López-Durán, Piñeiro, & Martínez, 2013; Zvolensky, Jenkins, Johnson, & Goodwin, 2011) and borderline PDs (Donald, Chartrand, & Bolton, 2013). Second, although ND is a key issue in the smoking field, it has not always been assessed in the studies about the relationship between PD and cigarette use. For example, Zvolensky et al. (2011) found a modest association between smoking without ND and PDs, with the exception of antisocial PD. However, when ND was assessed, odds ratios increased significantly for all PDs. Becoña et al. (2013)

confirmed that individuals with a paranoid, narcissistic, antisocial, or borderline PD had a higher likelihood for being current smokers, with significantly higher odds when they took into account ND. Finally, previous research has also found that comorbid mental disorders could partly explain the relationship between PDs and cigarette use (e.g., Afifi et al., 2011; Jackson & Burgess, 2004). For example, the strength of the observed association between paranoid and schizoid PD (Zvolensky et al., 2011) or borderline PD (Becoña et al., 2013) was attenuated after taking into account the presence of other mental disorders (e.g., mood, anxiety disorders).

Findings regarding the relationship between PDs and smoking in people seeking smoking cessation treatment are contradictory. For instance, Gariti, Alterman, Mulvaney, and Epperson (2000) did not find significant differences in a combined treatment (psychosocial and pharmacological) for smoking cessation between smokers with or without any PD. However, a recent study carried out in Spanish smokers pointed out that borderline, antisocial, or avoidant PDs were associated with lower cessation rates, whereas schizoid PD was related to the maintenance of abstinence (Piñeiro, Fernández del Río, López-Durán, Martínez, & Becoña, 2013).

So, due to the existence of differences between smokers from both populations and the potentially confounding effect of psychiatric comorbidity and ND in the relationship between PDs and cigarette use, there is a clear need to analyze deeply this association. The aim of the present study was to compare the presence of PDs in Spanish smokers from general and clinical population, taking into account ND and the presence of any lifetime mental disorder.

## Method

### Participants

This study was carried out in two samples of Spanish smokers aged 18 or older. The clinical sample was formed of participants seeking psychological treatment for smoking cessation at the Smoking Cessation and Addictive Disorders Unit of the Faculty of Psychology at the University of Santiago de Compostela (January 2009–December 2013). The inclusion criteria were: age 18 or over; a wish to participate in the treatment; smoking 10 or more cigarettes per day, and having completed the pretreatment assessment questionnaires. Exclusion criteria were: diagnosis of a severe mental disorder (bipolar and/or psychotic disorder), concurrent dependence on other substances, having participated in the same or similar treatment over the previous year, having received another type of effective smoking cessation treatment (nicotine replacement therapy, bupropion, varenicline) in the previous year, suffering from a physical pathology with a high life risk which would require immediate individual intervention (e.g., recent myocardial infarction), smoking tobacco other than cigarettes (e.g., cigars), refusing to be video-recorded during the treatment sessions, and failing to attend the first treatment session. From an initial sample of 680 smokers, 68 were excluded based on inclusion and exclusion criteria, with the final sample comprising 560 smokers (41.1% men and 58.9% women) with a mean age of 41.45 years ( $SD = 10.46$ , range 19–86).

Details of the sampling frame of participants from the general population who did not seek treatment to stop smoking are described elsewhere (see Becoña et al., 2013). Smokers from the

general population were personally interviewed in their homes between June 2009 and July 2010. Inclusion criteria were: age 18 or over, smoking at least 1 cigarette per day in the last month, and having completed the questionnaires. The final sample comprised 519 smokers (53.2% men and 46.8% women) with a mean age of 43.24 years ( $SD = 16.13$ , range 18–85).

Sample description about sociodemographics, smoking-related variables, mental health history, and PDs are presented in Table 1.

### Instruments

Sociodemographic information (gender, age, educational level, and marital status) and smoking-related variables were assessed. ND was assessed by means of the Fagerström Test for Nicotine Dependence (FTND, Heatherton, Kozlowski, Frecker, & Fagerström, 1991; Spanish version by Becoña & Vázquez, 1998). A cut-off point of six or more was used. The reliability obtained by means of Cronbach's alpha was .70.

Mental health history was determined by whether smokers indicated suffering any lifetime mental disorder (0 = no, 1 = yes). We also assessed whether participants had ever received treatment for depression (0 = no, 1 = yes).

For the assessment of PDs, the International Personality Disorder Examination Questionnaire, IPDEQ, DSM-IV module (a self-report screening instrument comprising 77 items in true–false response format), was used (Loranger, 1995; Spanish version by López-Ibor, Pérez-Urdániz, & Rubio, 1996). Loranger, Janca, and Sartorius (1997) established a cut-off point of three or more positive items for considering a PD as probable, but this very low cut-off point notably increases the number of false positives at the cost of increasing the sensitivity of the instrument. With the aim of increasing the specificity of the IPDEQ, we used the diagnostic criteria established by the DSM-IV for each PD as the cut-off points, in line with previous studies (Fernández del Río, Martínez-Vispo, & Becoña, 2011; Lewin, Slade, Andrews, Carr, & Hornabrook, 2005). Therefore, the cut-off points vary from three to five positive criteria: three corresponds to an antisocial disorder, four to a paranoid, schizoid, obsessive-compulsive and avoidant disorder, and five to a schizotypal, histrionic, narcissistic, borderline, and dependent PD (Fernández del Río et al., 2011).

### Procedure

Participants from the clinical sample were initially assessed when they requested psychological treatment for smoking cessation. The psychological treatment administered was the Smoking Cessation Program by Becoña (2007), a manualized cognitive-behavioral treatment that comprises 6 group-format sessions over six weeks (one session per week).

The general population sample is a representative sample of adults from 13 cities in Galicia (Spain) stratified by gender and age. The streets from which the sample was recruited were randomly selected. The first inhabited house in each street was selected randomly to begin the recruitment. Before interviewing the participants, interviewers had to check that they had been living there for at least six months, inform them about the aims of the study and obtain their informed consent to participate. All the interviews were carried out face-to-face by psychologists especially trained for that purpose.

All the participants, from general and clinical populations, gave their informed consent for participation, and the study was authorized by the Bioethics Committee of the University of Santiago de Compostela (Spain).

*Data analysis*

Analyses were carried out using PASW Statistics 18. Crosstabulations were calculated to determine the prevalence of cigarette smokers with specific PDs, including non-dependent and dependent smokers from both samples. Chi-square analyses with Bonferroni correction were carried out on bivariate analyses. Differences were considered statistically significant at  $p < .05$  ( $p < .025$  or  $p < .016$  for chi-square with Bonferroni correction). Odds ratios (ORs) were then derived to establish the association between PDs and type of population (general, clinical). Next, adjusted odds ratios (AOR) were calculated adjusting for sociodemographics (gender, age, marital status, and educational level) and for any mental disorder and for lifetime treatment for depression.

**Results**

*Differences among smokers according to the type of population*

The comparison between smokers from the general and the clinical population revealed significant differences according to

sociodemographics, smoking-related variables, mental health history, and PDs (see Table 1). The results revealed that smokers seeking smoking cessation treatment were mainly women and had a higher level of education. They also began smoking at an earlier age, smoked more cigarettes/day, had a higher level of ND, had a greater desire to stop smoking, and were more motivated to quit smoking than smokers from the general population. According to mental health, a higher percentage of smokers from the clinical sample than from the general population had experienced any lifetime mental disorder and had received treatment for depression in the past.

Regarding PDs, the percentage of paranoid, schizoid, schizotypal, antisocial, borderline and dependent PDs were significantly higher among smokers seeking psychological treatment to quit smoking than among smokers from the general population. However, avoidant PD was more prevalent among smokers who did not seek treatment to quit smoking.

*Association between type of population (general vs. clinical), ND and PDs*

Participants from the clinical population presented higher odd ratios of paranoid, schizoid, schizotypal, borderline, antisocial, and dependent PDs, adjusted for demographics and for lifetime mental disorder and lifetime treatment for depression (see Table 2)

*Table 1*  
Sociodemographics, smoking-related variables, mental health history, and PDs in general and clinical samples

|  | Clinical population<br>(n = 560) | General population<br>(n = 519) | $\chi^2 / t$ | Cramer's V/ Cohen's d |
|--|----------------------------------|---------------------------------|--------------|-----------------------|
| <i>Sociodemographics</i>                 |                                  |                                 |              |                       |
| Gender (male)                            | 41.1                             | 53.2                            | 15.86***     | .12                   |
| Age (40 or less)                         | 45.5                             | 47.2                            | 0.30         |                       |
| Marital status (married)                 | 50.2                             | 54.1                            | 7.27         |                       |
| Educational level (high)                 | 43.1                             | 14.5                            | 109.32***    | .32                   |
| <i>Smoking-related variables</i>         |                                  |                                 |              |                       |
| Age at initiation of smoking             | 17.93 (4.05)                     | 19.09 (5.15)                    | -4.08***     | -.26                  |
| No. of cigarettes smoked per day         | 21.33 (8.17)                     | 15.44 (9.58)                    | 10.84***     | .68                   |
| FTND (score 6 or more)                   | 45.9                             | 11.4                            | 155.04***    | .38                   |
| Desire to stop smoking (0-10)            | 8.79 (1.59)                      | 4.85 (3.86)                     | 21.67***     | 1.66                  |
| Stage of readiness to quit (preparation) | 25.4                             | 3.5                             | 533.31***    | .70                   |
| <i>Mental Health</i>                     |                                  |                                 |              |                       |
| Lifetime mental disorder (yes)           | 43.4                             | 12.5                            | 125.99***    | .34                   |
| Lifetime Treatment for Depression (yes)  | 38.9                             | 12.7                            | 95.43***     | .30                   |
| <i>PDs (yes)</i>                         |                                  |                                 |              |                       |
| Paranoid                                 | 27.1                             | 10.8                            | 45.85***     | .21                   |
| Schizoid                                 | 72.9                             | 7.9                             | 468.21***    | .66                   |
| Schizotypal                              | 9.1                              | 1.3                             | 31.96***     | .17                   |
| Histrionic                               | 14.5                             | 11.4                            | 2.32         |                       |
| Antisocial                               | 33.2                             | 9.2                             | 90.64***     | .29                   |
| Narcissistic                             | 12.6                             | 9.8                             | 2.02         |                       |
| Borderline                               | 21.4                             | 9.6                             | 28.23***     | .16                   |
| Obsessive-compulsive                     | 31.6                             | 38.3                            | 5.38*        | .07                   |
| Dependent                                | 10.6                             | 5.2                             | 10.50***     | .10                   |
| Avoidant                                 | 36.9                             | 31.4                            | 3.54         |                       |

FTND: Fagerström Test for Nicotine Dependence  
Means (SD) presented for continuous variables and percentages presented for categorical variables  
\*  $p < .025$  (Bonferroni correction), \*\*\*  $p < .001$

compared to non-dependent smokers from the general population. Odds ratios were higher when smokers were nicotine dependent, except in the case of paranoid PD, where AORs were similar.

Regarding borderline and dependent PDs, we also found that nicotine-dependent smokers from the general population presented these PDs to a greater extent than non-nicotine-dependent smokers. The likelihood of presenting an avoidant PD was only higher in nicotine-dependent smokers seeking smoking cessation treatment when compared to non-dependent smokers from the general population. In contrast, we found that non-dependent smokers from the clinical population had a lower likelihood of presenting an obsessive compulsive PD compared to the non-dependent smokers from the general population. There was no significant association between current smoking, with or without ND, type of population, and histrionic or narcissistic PDs.

Discussion

The purpose of the present study was to compare the presence of PDs in Spanish smokers from the general and clinical population,

taking into account ND and the presence of any lifetime mental disorder. Results indicated that participants seeking treatment to quit smoking had a higher likelihood of presenting a paranoid, schizoid, schizotypal, borderline, antisocial, and dependent PD, compared to smokers from the general population. These findings are consistent with those of previous research suggesting a greater use of mental health resources by people with PDs (Bender et al., 2001). As an explanation for this increased demand for treatment, Ansell, Sanislow, McGlashan, and Grilo (2007) pointed out that people with a PD, especially borderline PD, are characterized by higher detrimental impacts on daily functioning and lower quality of life than people without mental disorder diagnosis. An alternative explanation is the one mentioned by Powers and Oltmanns (2013), who concluded that people with paranoid, schizoid, schizotypal, borderline, antisocial, and avoidant PDs have a worse health perception and, therefore, they require more health care.

ND seems to be a key variable associated with PDs. Findings showed that the likelihood of presenting a paranoid, schizoid, schizotypal, borderline, antisocial, and dependent PD increases

Table 2  
PDs, group of reference, smoking, and ND

|                        | No paranoid PD   | Paranoid PD   | OR (95% CI)         | AOR* (95%CI)        | AOR <sup>†</sup> (95%CI) | No schizoid PD      | Schizoid PD   | OR (95% CI)            | AOR* (95%CI)           | AOR <sup>†</sup> (95%CI) | No schizotypal PD          | Schizotypal PD          | OR (95% CI)          | AOR* (95%CI)         | AOR <sup>†</sup> (95%CI) |
|------------------------|------------------|---------------|---------------------|---------------------|--------------------------|---------------------|---------------|------------------------|------------------------|--------------------------|----------------------------|-------------------------|----------------------|----------------------|--------------------------|
| Smoker GP, no ND (Ref) | 47.5 (413)       | 22.7 (47)     | 1.00                | 1.00                | 1.00                     | 67.4 (424)          | 8.0 (36)      | 1.00                   | 1.00                   | 1.00                     | 44.5 (454)                 | 10.3 (6)                | 1.00                 | 1.00                 | 1.00                     |
| Smoker GP, ND          | 5.7 (50)         | 4.3 (9)       | 1.58 (0.73-3.42)    | 1.54 (0.71-3.35)    | 1.46 (0.67-3.18)         | 8.6 (54)            | 1.1 (5)       | 1.09 (0.41-2.90)       | 1.10 (0.41-2.94)       | 1.12 (0.42-2.98)         | 5.7 (58)                   | 1.7 (1)                 | 1.31 (0.15-11.03)    | 1.23 (0.15-10.44)    | 1.11 (0.13-9.45)         |
| Smoker CP, no ND       | 25.4 (221)       | 39.6 (82)     | 3.26*** (2.20-4.84) | 3.26*** (2.15-4.94) | 2.92*** (1.91-4.47)      | 13.2 (83)           | 48.9 (219)    | 31.08*** (20.34-47.48) | 30.13*** (19.39-46.82) | 31.07*** (19.75-48.86)   | 27.3 (278)                 | 41.4 (24)               | 6.53*** (2.64-16.18) | 7.67*** (3.02-19.45) | 6.44*** (2.50-16.60)     |
| Smoker CP, ND          | 21.4 (186)       | 33.3 (69)     | 3.26*** (2.17-4.91) | 3.14*** (2.06-4.78) | 2.68*** (1.72-4.17)      | 10.8 (68)           | 42.0 (188)    | 32.56*** (20.99-50.51) | 31.92*** (20.40-49.96) | 33.52*** (20.90-53.77)   | 22.5 (230)                 | 46.6 (27)               | 8.88*** (3.62-21.82) | 9.63*** (3.85-24.05) | 7.45*** (2.88-19.24)     |
|                        | No borderline PD | Borderline PD | OR (95% CI)         | AOR* (95%CI)        | AOR <sup>†</sup> (95%CI) | No antisocial PD    | Antisocial PD | OR (95% CI)            | AOR* (95%CI)           | AOR <sup>†</sup> (95%CI) |                            |                         |                      |                      |                          |
| Smoker GP, no ND (Ref) | 46.6 (424)       | 21.2 (36)     |                     | 1.00                | 1.00                     | 50.0 (422)          | 16.3 (38)     | 1.00                   | 1.00                   | 1.00                     |                            |                         |                      |                      |                          |
| Smoker GP, ND          | 5.0 (45)         | 8.2 (14)      |                     | 3.66*** (1.84-7.30) | 3.61*** (1.80-7.23)      | 3.20** (1.57-6.50)  | 4.3 (10)      | 2.27* (1.06-4.83)      | 2.18* (1.01-4.70)      | 2.02 (0.92-4.40)         |                            |                         |                      |                      |                          |
| Smoker CP, no ND       | 27.8 (253)       | 29.4 (50)     |                     | 2.33*** (1.48-3.67) | 2.48*** (1.54-3.99)      | 1.88* (1.15-3.07)   | 38.6 (90)     | 4.69*** (3.10-7.09)    | 5.62*** (3.62-8.72)    | 4.87*** (3.11-7.62)      |                            |                         |                      |                      |                          |
| Smoker CP, ND          | 20.6 (187)       | 41.2 (70)     |                     | 4.41*** (2.85-6.83) | 4.49*** (2.87-7.05)      | 3.04*** (1.89-4.91) | 40.8 (95)     | 6.59*** (4.34-10.01)   | 7.78*** (5.02-12.06)   | 6.18*** (3.91-9.76)      |                            |                         |                      |                      |                          |
|                        | No avoidant PD   | Avoidant PD   | OR (95% CI)         | AOR* (95%CI)        | AOR <sup>†</sup> (95%CI) | No dependent PD     | Dependent PD  | OR (95% CI)            | AOR* (95%CI)           | AOR <sup>†</sup> (95%CI) | No obsessive-compulsive PD | Obsessive-compulsive PD | OR (95% CI)          | AOR* (95%CI)         | AOR <sup>†</sup> (95%CI) |
| Smoker GP, no ND (Ref) | 44.7 (317)       | 38.8 (143)    | 1.00                | 1.00                | 1.00                     | 44.6 (442)          | 20.9 (18)     | 1.00                   | 1.00                   | 1.00                     | 40.3 (283)                 | 47.1 (177)              | 1.00                 | 1.00                 | 1.00                     |
| Smoker GP, ND          | 5.5 (39)         | 5.4 (20)      | 1.14 (0.64-2.02)    | 0.96 (0.53-1.74)    | 1.06 (0.59-1.90)         | 5.0 (50)            | 10.5 (9)      | 4.42** (1.89-10.36)    | 4.12** (1.75-9.71)     | 3.81** (1.61-9.03)       | 5.3 (37)                   | 5.9 (22)                | 0.95 (0.54-1.66)     | 0.94 (0.53-1.66)     | 0.89 (0.50-1.57)         |
| Smoker CP, no ND       | 28.2 (200)       | 27.9 (103)    | 1.14 (0.84-1.56)    | 1.04 (0.74-1.47)    | 1.26 (0.91-1.76)         | 28.0 (278)          | 29.1 (25)     | 2.21* (1.18-4.12)      | 2.50** (1.31-4.78)     | 2.09* (1.07-4.07)        | 31.4 (221)                 | 21.8 (82)               | 0.59** (0.43-0.81)   | 0.54** (0.38-0.75)   | 0.48*** (0.34-0.68)      |
| Smoker CP, ND          | 21.6 (153)       | 27.9 (103)    | 1.49* (1.09-2.05)   | 1.19 (0.83-1.70)    | 1.55** (1.11-2.15)       | 22.4 (222)          | 39.5 (34)     | 3.76*** (2.08-6.81)    | 3.82*** (2.08-7.02)    | 3.01** (1.58-5.74)       | 23.0 (162)                 | 25.3 (95)               | 0.94 (0.68-1.29)     | 0.84 (0.60-1.16)     | 0.71 (0.50-1.00)         |

GP = General Population; CP = Clinical Population; AOR, Adjusted Odds Ratio; 95%CI, 95% confidence intervals. Reference categories for each variable are identified with (Ref)  
AOR\* = adjusted for age, gender, marital status, educational level. AOR<sup>†</sup> = adjusted for any mental disorder and lifetime treatment for depression  
\* p<.05; \*\* p<.01; \*\*\* p<.001

further when individuals who seek treatment to quit smoking are nicotine dependent, even after adjusting for the presence of any lifetime mental disorder and lifetime treatment for depression. Previous research has indicated that there is a strong relationship between ND and several PDs such as antisocial (Zvolensky et al., 2011) or schizotypal (Pulay et al., 2010). The studies (e.g., Brook, Zhang, Balka, Seltzer, & Brook, 2013) indicate the need to take into account certain personality traits such as low self-control, high resistance to rules, impulsivity and sensation-seeking (characteristics of both antisocial and borderline PDs) in smoking cessation programs because resistance to rules and ND are positively associated with each other, which would partially explain the difficulties to quit for people with antisocial and borderline PDs.

We have found that ND is also relevant in the relation between certain PDs and cigarette use in individuals from the general population: nicotine-dependent smokers had a higher likelihood of presenting borderline PD and dependent PD than non-nicotine-dependent smokers, with odd ratios similar to those of nicotine dependent smokers of the clinical population.

Therefore, treatment-seeking smokers have a higher likelihood of presenting a PD than smokers from the general population, and this likelihood is even higher if ND is present. However, it appears that obsessive-compulsive PD is an exception. The only significant relationship that we found is that non-nicotine-dependent smokers seeking treatment had a lower likelihood of presenting an obsessive compulsive PD than non-nicotine-dependent smokers from the general population. Although they do not follow the same tendency as the rest of PDs, these results confirm previous studies carried out by our team in the general population (Becoña et al., 2013) that indicate that non-nicotine dependent smokers, compared to never-smokers, have a greater likelihood of presenting an obsessive-compulsive PD. So, it appears that people with an obsessive-compulsive PD are less likely to seek smoking cessation treatment. Some characteristics of this PD (high conscientiousness, inflexibility, over-control, and perfectionism) could explain the existence of greater control over tobacco use, which implies a lower likelihood of becoming nicotine-dependent and, therefore, a lower need for smoking cessation treatment. We know that the greater the ND, the harder it is to quit smoking without help (Fiore

et al., 2008), so nicotine dependent smokers would require more intensive interventions.

Some limitations to this study should be noted. First, it would be advisable in future research to use the complete IPDE clinical interview or the SCID-II for PDs, and SCID-I for other mental disorders. But, in the case of general population, it is difficult to use this kind of instruments, given the assessment characteristics in this type of studies (e.g., limited time, place in which the assessment is conducted, etc.). Second, these results are only generalizable to adult Spanish smokers.

Despite these limitations, the current findings are relevant and have direct clinical use in the context of smoking cessation interventions. Firstly, despite the population of smokers with mental disorders has received less attention (Rüther et al., 2014), our results indicate that they are interested in quitting smoking. Given that having a mental disorder is associated with a lower likelihood of quitting smoking (Donald et al., 2013) and that ND also makes it more difficult (Fiore et al., 2008), our results suggest the need to adapt smoking cessation programs to the characteristics of the population of smokers with mental disorders (e.g., Fernández del Río, López-Durán, & Becoña, 2011). Therefore, we should take into account the assessment of PDs in people seeking smoking cessation treatment (e.g., Hasin et al., 2011), as well as to analyze the need to include specific components in the treatment that will increase the likelihood of quitting. Authors like Trull, Jahng, Tomko, Wood, and Sher (2010) concluded that people with a PD usually present substance use disorders, so it is important to take it into account for the assessment and treatment of smoking cessation. Finally, as in previous studies (Piñero et al., 2013), this study revealed differential (and opposing) relationships between specific PDs and smoking cessation outcomes (e.g., obsessive-compulsive PD), illustrating the need to consider PDs separately when analyzing their relationship with the consumption of substances such as tobacco.

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