Anxiety and depressive symptoms among smokers: a population study*

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Abstract

Background: Smoking prevalence is higher among psychiatric patients than general population. However, some investigations suggest there is a significant association between smoking and mental disorder in people without having a definite diagnosis for mental disorder dwelling in communities. **Aim**: To examine the association between nicotine regular use and anxiety and depressive symptoms in general population in the City of Bucaramanga, Colombia. **Methods**: A representative sample of 1180 persons, 11 years of age and older, was studied. We defined smokers, those who smoke everyday during last month. Zung's scales for anxiety and depression were applied for rating anxious and depressive symptoms. Confounding was controlled by binomial regression. **Results**: Smoking prevalence was 18.1%. We observed a statistical association after controlling confounders between smoking and clinically important depressive symptoms (PR 1.69, CI 95% 1.32-2.17). However, we did not find any association between smoking and anxious symptoms. **Conclusion**: Smoking may be a symptom of depressive disorder in this population. Further investigations are needed about causal relation between smoking and depression. [*Campo-Arias A, Díaz LA, Ruega GE. Anxiety and depressive symptoms among smokers: a population study. MedUNAB 2004; 7:4-8*]

Key words. Smoking, Prevalence, Anxiety, Depression, General Population

Background

Smoking prevalence in psychiatric practice, out and in-patients, is higher that the general population, especially in people with substance related disorders and disorders with important psychotic symptoms.[1] Studies involving community residents without formal diagnosis of mental disorder report a significant association between regular nicotine intake and depressive symptoms.[2, 3] But, investigations show inconsistent association between smoking and anxiety symptoms.[4-6]

Nicotine and others tobacco's components may constitute the main cause for preventable morbidity, as well as, a priority for public health issues.[7, 8] This is responsible for the dependence induced by smoking. At the same time, nicotine induces functional changes in *accumbens nuclei, locus ceruleus* and other groups of neurons in the central nervous system.[9, 10] Therefore, regular nicotine use is considered as a form of a self-medication, in order to, control anxiety and depressive symptoms in ordinary life.[11]

Tobacco use a public health problem, is the number one preventable cause of morbidity and mortality in the world.[12] It is necessary to know the association among smoking and emotional symptoms, this is relevant for smoking prevention and quitting approaches.

The objective of this report is to evaluate the association between smoking and clinically important anxious and depressive symptoms in general population from Bucaramanga, Colombia.

Methods

A randomized sample was select from persons over 11 year-old living in Bucaramanga, Colombia for more than one year. In the rural area, we selected, sixty people at random from sixty houses in three villages selected by convenience. In the urban area, we fist chose 160 out of 668 blocks. Afterward, we selected one house from every seven houses on each block. Just one person selected at random in each house was recruited for the survey. The sample was stratified by age and gender.

Ten training assistant nurses administered this survey, could explain questions when people asked for it, to read for illiterate or persons with visual impairment. The survey asked eight mental health topics: general demographic characteristics; acts related to violence; suicidal ideation, planning and attempts; alcohol, nicotine, and other drug use, working satisfaction, self-concept; anxiety and depressive symptoms.

Instruments employed were integrated the Spanish version of "Risk Behavior Survey" development by the Center for Disease Control and Prevention,[13] the Drug Surveillance survey,[14] the C.A.G.E. alcoholism index,[15] and Zung's scale for anxiety and depression.[16, 17] Smokers were considered people who smoked regularly over the last month.

Data were stored in Epi-Info 6.04d,[18] and then analyzed with STATA 7.[19] Descriptive and bivariate analysis was done. We calculate relations between each category into each variable versus smoking status by estimating their prevalence rate (PR) and 95% confidence intervals (CI 95%). Significance by linear tendency chi square (X^2_{tl}) was calculated for categorical variables like anxiety and depressive symptoms. Significant difference was defined as alpha error less than 5% (p<0.05). Finally, a binomial model regression was done following Greenland's recommendations,[20] and validating with goodness-of-fit of Tsiatis' strategy.[21]

Results

A total of 1180 persons responded to all questionnaires. A group of 45 questionnaires (3.7%) was excluded because of inconsistent information. More details appear elsewhere.[21] By gender, 599 (50.8%) were female and 581 (49.2%) were male. Aged ranged from 12 to 92 with a mean of 38.7 (SD 19.2); and 702 persons (61.3%) had a stable sexual partner.

A group of 214 people reported to be smokers, showing a last month prevalence of 18.1% (CI 95%, 16.0-20.5). 106 persons (9.0%; CI 95%, 7.4-10.8) reported being former smokers. Smoking prevalence was higher among male (24.3%) than female group (12.2%) (PR 1.99; CI 95%, 1.54-2.58; p<0.0001).

Table 1. Association between anxious and depressive symptoms and smoking prevalence

Anxiety*			
Severity	Persons	Smokers	PR (CI 95%)
None	754	127 (16.8%)	Referent
Mild	247	47 (19.0%)	1.13 (0.84 – 1.53)
Moderate	127	26 (20.5%)	1.22 (0.83 – 1.78)
Severe	32	7 (21.9%)	1.30 (0.66 – 2.55)
Depression**			
Severity	Persons	Smokers	PR (CI 95%)
None	648	89 (13.7%)	Referent
Mild	296	59 (19.9%)	1.45 (1.08 – 1.96)
Moderate	191	53 (27.7%)	2.02 (1.50 – 2.73)
Severe	25	7 (28.0%)	2.04 (1.06 – 3.93)

* χ^2_{TL} = 1.73, df=3, p>0.05
** χ^2_{TL} = 22.79, df=3, p<0.0001

A total of 406 out of 1180 subjects (35%; CI 95% 32, 2-37.8) who completed Zung's scales for anxiety reported anxious symptoms clinically significant. Anxiety symptoms were mild in 247 (21.3%), moderate in 127 (10.9%), and severe in 32 (2.8%). Beside, depressive symptoms were clinically significant in 512 people (44.1%; CI 95% 41.3-47.1). Depression was mild in 296 (25.5%), moderate in 191 (16.5%), and severe in 25 (2.1%).

In bivariate analysis, smokers reported more depressive symptoms than non-smokers (23.4% versus 12.4%; PR 1.69, IC 95% 1.32-2.17; p<0.0001). But, anxiety symptoms were similar among smokers and non-smokers (19.7% versus 16.8%; PR 1.18, IC 95% 0.91- 1.51, p>0.05; table 1).

Table 2 shows associations between smoking with each variable. Age was used as a categorical variable, five age groups, in the multivariate model. Table 3 presents a model that adjusts adequately (p=0.958). In this model, anxiety symptoms were negatively associated with smoking and depressive symptoms positively.

Discussion

This study presents significant association between several behavior and psychosocial stressors and smoking. It is important to make a strong point of smoking is positive associated with depressive symptoms, but negatively associated with anxious symptoms.

These findings are similar to other investigations that report an important relationship between smoking and depressive symptoms. Several studies from different coun-

Table 2. Conditions associated with smoking

Exposition variable	Smoking among exposed	Smoking among non-exposed	PR	CI 95%	p
Being male	141/581 (24.3%)	73/599 (12.2%)	1.16	1.10-1.12	0.000
Living in urban area	212/1120 (18.9%)	2/60 (3.3%)	6.77	1.61-40.26	0.004
Have a stable partner	140/702 (19.9%)	69/443 (15.6%)	1.05	1.00-1.11	0.063
Carry a gun during last month	54/127 (48.5%)	159/1045 (15.2%)	1.48	1.27-1.72	0.000
Being menaced last year	36/154 (23.4%)	177/1021 (17.3%)	1.08	0.98-1.18	0.070
Physical fighting last year	68/225 (30.2%)	145/951 (15.2%)	1.21	1.11-1.33	0.000
Being beat by partner last year	22/74 (29.7%)	187/1071 (17.5%)	1.70	1.17-2.47	0.008
Sexual relationship without consent lifetime	19/67 (28.4%)	193/1105 (17.5%)	1.15	0.99-1.34	0.025
Suicide ideation last year	27/92 (29.3%)	187/1084 (17.3%)	1.17	1.02-1.34	0.004
Suicide plan last year	24/81 (29.6%)	191/1092 (17.4%)	1.17	1.02-1.36	0.006
Suicide attend last year	12/59 (20.3%)	201/1113 (18.1%)	1.03	0.90-1.17	0.658
Hypnotic use last year	4/8 (50.0%)	208/1163 (17.9%)	1.64	0.82-3.29	0.019
Cannabis use last year	9/9 (100%)	203/1167 (17.4%)	indef.	indef.	0.000
Inhalant use last year	3/4 (75.0%)	210/1175 (17.9%)	3.29	0.60-17.94	0.020
Cocaine use last year	5/5 (100%)	207/1168 (17.7%)	indef.	indef.	0.000
Drinking alcohol	34/131 (26.0%)	180/1049 (17.2%)	1.51	1.10-2.08	0.014
Laboral dissatisfaction	74/295 (25.1%)	136/874 (15.6%)	1.12	1.05-1.20	0.000
Doing diet to lose weight	23/72 (31.9%)	186/1094 (17.0%)	1.22	1.04-1.43	0.001
Using diet supplement to lose weight	16/57 (28.1%)	195/1114 (17.5%)	1.15	0.97-1.35	0.043
Using laxative/emetic for losing weight	15/42 (35.7%)	196/1129 (17.2%)	1.29	1.02-1.61	0.002

Indef.: Indefinite

tries have reported a significant association smoking and depressive symptoms or disorders.[4, 6, 23-27] Perez-Stable et al,[23] for example, reported more depressive symptoms among smokers than non smokers among Latin people living in United Stated. Similarly, Lasser et al[26] observed that smokers presented higher prevalence of major depressive disorder and distimic disorder than non smokers, while Degenhardt et al[27] reported that people with depressive disorders had two-fold risk for smoking.

However, association between smoking and anxiety symptoms and disorders is less consistent. Some investigation reported association;[6, 24-28] but other do not.[4, 5] Romans et al[6] found that anxiety increases probability for smoking among women. Breslau et al[28] reported that smoking increased four times the risk for panic attack. However, Glassman et al,[4] and Johnson et al[29] reported no association. These differences could be explained by the design of those studies. Longitudinal studies suggest that smoking could induce anxiety disorders,[6, 28] but cross sectional studies point out that people with anxiety do not start smoking.[4, 29] It is too hard to explain the negative association between smoking and anxiety symptoms presented in this paper. However, Picciotto et al suggest that smoking has anxiolytic effect just among smokers.[30] Nicotine reduces anxiety caused by withdrawal, but it is not, per se, an anxiolytic substance.

The association between smoking and depression could be explained by antidepressant effect of nicotine.[30] Some investigators had observed that depressed smokers have more difficulty than non-depressed for quitting smoking.[31] Likewise, some studies report that smokers with history of depression present high risk of depressive relapse when quitting smoking.[32, 33] By other hand, it has been suggested that depression and smoking both share environmental, as well, and biological common predisposing factors.[34]

Table 3. Binomial regression model for smoking

Variable	PR	CI, 95%	p
Mild depressive symptoms	1.81	1.41 - 2.32	0.000
Moderate depressive symptoms	2.11	1.58 - 2.81	0.000
Severe depressive symptoms	2.17	1.41 - 3.35	0.000
Mild anxious symptoms	0.69	0.56 - 0.84	0.000
Moderate anxious symptoms	0.78	0.63 - 0.97	0.029
Severe anxious symptoms	1.12	0.74 - 1.92	0.480
20-29 years	1.53	1.24 - 1.87	0.000
30-44 years	1.44	1.10 - 1.91	0.010
45-59 years	1.57	1.12 - 2.20	0.008
>60 years	1.10	0.73 - 1.64	0.658
Being male	2.13	1.71 - 2.64	0.000
Partner hit him/her	1.36	1.05 - 1.76	0.020
Sexual intercourse without consent lifetime	1.78	1.34 - 2.36	0.000
Suicide thinking	1.17	1.10 - 1.35	0.027
Cannabis use	3.47	2.70 - 4.46	0.000
Urban dwelling	9.87	1.47 - 66.3	0.018

It possible that ethnic and cultural differences could be important for manifestations of anxiety symptoms and could, also explain the negative association between smoking and anxiety in, found, in this study. There are studies that report ethnic, racial (genetic) and cultural factors as playing a relevant role in smoking prevalence and associated features.[35, 36]

The significant relationship between smoking and depressive symptom is very important for public health. Possibly, early identification and treatment of depressive disorders reduce smoking prevalence in general population and decrease mortality related tobacco use.

This study has its own limitations. Nevertheless, the results provide evidence of the need to investigate emotional symptoms among smoking people; maybe treating depressive symptoms would reduce prevalence and morbidity related to smoking. Also, it necessary to research how social and cultural factors modify smoking prevalence among susceptible persons, including subjects with anxiety or depressive symptoms of clinical importance. Moreover,

for us, will be very important to know what role, if any, Colombian's violence plays in the smoking prevalence among its population.

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