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ORIGINAL ARTICLE

Emotional factors are critical motivators for tobacco use according to smokers' own perception

Bruna Amélia Moreira Sarafim-Silva[1] · Vitor Bonetti Valente[1] · Gabrielle Dias Duarte[1] · Clícia Keiko Sakamoto Nishida[2] · Edilze Fatima Gardenal Fani[2] · Glauco Issamu Miyahara[1] · Éder Ricardo Biasoli[1] · Daniel Galera Bernabé[1,3]

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Abstract

Aim Psychological factors play an important role in tobacco dependence. However, few investigations have focused on smokers' own perception about motivations for tobacco consumption using open-ended questions.

Subject and method In this study, we used the Collective Subject Discourse (CSD) method to investigate the motivations for tobacco use according to smokers' own perception in 135 current smokers.

Results The vast majority of patients (83.7%) reported that they smoked cigarettes when seeking relief or emotional comfort. When asked why they smoked, most declared they smoked due to stress, anxiety, or nervousness. Long-term smokers reporting using cigarettes to feel pleasure, in contrast to short-term smokers, who mostly reported they smoked because they felt stress or anxiety ($p < 0.001$). Most of the patients (71.2%) also reported emotional factors as the reason for increasing the desire to smoke. Heavy smokers smoked more in moments when they felt alone compared to light smokers ($p = 0.034$).

Conclusion The smokers' collective discourses demonstrate that from their own perception, psychological factors are the motivational basis for their use of cigarettes. Therefore, most smokers are conscious of the impact of emotional factors on smoking dependence, and this may play a critical role in quit-smoking programs, as well as presenting an important factor for public health.

Keywords Smoking · Tobacco use · Addiction behaviour · Psychological factors · Emotional disorder

Introduction

According to the International Statistical Classification of Diseases and Related Health Problems (ICD-11 2018), tobacco smoking is considered a mental and behavioral disorder, because of the psychoactive substances involved. Smoking produces changes in the central nervous system (CNS), behavior and emotions, leading to abuse and addiction (Wand 2008). Tobacco abuse is also related to the single greatest preventable cause of illnesses and premature deaths worldwide (ICD-11 2018) and imposes a significant financial and social burden on society (Schuck et al. 2012). For most people, the mechanisms involved in the tobacco dependence process start with casual use of the substance, when sensitization in the brain's mesocorticolimbic reward system occurs (Wand 2008). Thus, users increasingly seek to repeat their gratification effects, which result in a greater motivation to use the substance again (Di Chiara et al. 2004; Wand 2008; Koob et al. 2014). On the other hand, chronic tobacco exposure produces a down-regulation of positive reward circuits and subsequent chronic stress, producing negative emotional states such as anxiety, depression, sadness, or dysphoria (Di Chiara et al. 2004; Wand 2008; Moylan et al. 2013; Koob et al. 2014). This adverse effect then becomes the driving force for drug abuse (Wand 2008; Koob et al. 2014).

Several factors are associated with the onset and maintenance of tobacco use, in particular symptoms of anxiety and depression, and the influence of family members (Rondina et al. 2007; Schuck et al. 2012). There is a strong correlation between psychological factors and the consumption of tobacco, as well as

✉ Daniel Galera Bernabé
danielbernabe@foa.unesp.br

[1] Psychosomatic Research Center, Oral Oncology Center, São Paulo State University (Unesp), School of Dentistry, Araçatuba, São Paulo, Brazil

[2] Mental Health Center, Birigui, São Paulo, Brazil

[3] Psychosomatic Research Center, Oral Oncology Center, São Paulo State University (UNESP), School of Dentistry, 1193 José Bonifácio St, Araçatuba, SP 15050-015, Brazil

other drugs (Sonntag et al. 2000; Rondina et al. 2007; Wand 2008). Clinical investigations have indicated a reduced probability of smoking cessation in smokers diagnosed with depression, and higher chances of relapse in abstinence periods compared with smokers without depression (Rondina et al. 2007). Other studies have shown that smoking may be considered a tool used to deal with anxiety (Slopen et al. 2012; Torres and O'Dell 2016). Recent evidence has demonstrated that the main reason why people use tobacco is to reduce anxiety and induce a relaxed state (Fidler and West 2009; Slopen et al. 2012; Torres and O'Dell 2016). According to Sonntag et al. (2000) individuals with a fear of social interaction have a higher risk of tobacco dependence, and smoking in the presence of a stressor event has been associated with reduced anxiety (Kassel and Shiffman 1997; Sonntag et al. 2000). Kassel and Shiffman (1997) revealed that smoking reduces the focus of attention from stressful thoughts and consequently attenuates anxiety. A study conducted with smokers of both sexes showed that regular smokers who do not quit the habit believe that smoking helps them to deal with anxiety. The authors used images and music for inducing mood changes in smokers, and found that negative mood states increased cigarette consumption after the end of the presentations (Choi et al. 2015).

Findings linking smoking with anxiety and stress (Booker et al. 2008), have also shown a close association between feelings of loneliness and tobacco use (Borges and Simões-Barbosa 2008). Studies have also revealed that in addition to helping reduce anxiety, the cigarette is also considered a companion in moments of anguish and loneliness (Borges and Simões-Barbosa 2008). A large proportion of the studies that have explored psychological factors as motivators for smoking dependence have used structured questionnaires (e.g., specific tests for anxiety, stress, and depression) or interviews with closed questions about smokers' emotional profiles. Few investigations have explored the motivations for smoking using open questions and crossed smokers' perceptions with epidemiological variables and smoking behavior data. In this study, we investigated the motivations for tobacco use according to smokers' own perception with a semi-structured questionnaire, and used Collective Subject Discourse (CSD) for data characterization. Moreover, the smokers' discourses were also analysed for associations with clinicopathological and smoking behavior variables.

Methods

Patients

Study design and sample

The investigators designed and implemented a cross-sectional study, approved by the Ethics Committee on Research with Human Beings (2011-01314), and conducted in compliance with the guidelines of the Helsinki Declaration. The study population was composed of 135 smokers. Participants were recruited from a head and neck cancer prevention program developed by Araçatuba Dental School, São Paulo State University (UNESP), São Paulo, Brazil in partnership with the quit-smoking program of the Mental Health Center, Birigui, São Paulo, Brazil. The study included patients who were active smokers at the time of the interview and had used cigarettes for at least the previous 10 years. Informed consent was obtained from all individual participants included in the study. Patients who had any cognitive impairment were excluded from the study, because they might not have understood the interview questions.

Semi-structured interview and study variables

Study data were obtained from medical records and individual interviews with a semi-structured questionnaire containing two parts. The primary predictor variables were demographic, medical, and tobacco behavior use data. The demographic data were age and gender (male or female). The medical variables included addictions other than smoking, and systemic diseases. The smoking behavior variables were time of use, cigarette type, number of cigarettes consumed per day, age at the time of first use of cigarettes, family smoking history, experience with the first cigarette, and reason for starting smoking. The epidemiological and smoking behavior data are shown in Table 1.

In the second part of the questionnaire, current smokers were asked about their motivations and reasons for tobacco use through four open questions: "What do you seek in a cigarette?"; "In what situations do you most want to smoke?"; "What do you feel while you are smoking?" and "Why do you smoke?". Responses from the open questions were considered secondary variables and were analyzed and grouped into categories according to CSD analysis (Lefevre et al. 2009).

Collective Subject Discourse analysis

The subjective data from the open questions were analyzed using the Collective Subject Discourse (CSD). This method is a subjective technique which analyzes collective dialog threads, extracting individual expressions, keywords, and similar statements made by participants and uniting them in a single discourse (Lefevre et al. 2009). Responses were categorized according to similarity, and are shown in Table 2.

Statistical analysis

Data were managed by the statistics service of the Psychosomatic Research Center. All data were stored in Microsoft Office Excel 2013, and the statistical analysis was

Table 1 Epidemiological characteristics and tobacco use profile

Variables	*N* (%)
Gender	
Female	81 (60%)
Male	54 (40%)
Mean age (years)	51
Length of use (years)	33.17
Cigarette type	
Filter	117 (86.7%)
Filter and hand-rolled	16 (11.9%)
Hand-rolled	2 (1.4%)
No. of cigarettes consumed per day	29.82
10 or less	13 (9.6%)
11–20	56 (41.5%)
21–30	24 (17.8%)
More than 30	42 (31.1%)
Age of first cigarette use (years)	
Childhood (0–11)	18 (18%)
Adolescence (12–18)	58 (58%)
Adult (older than 18)	24 (24%)
Smoking family history	
Father and mother	38 (29.7%)
Father and siblings	35 (27.3%)
Father only	22 (17.2%)
Siblings	13 (10.2%)
None	7 (5.5%)
Others	6 (4.7%)
Mother only	4 (3.1%)
Mother and siblings	3 (2.3%)
Experience with first cigarette	
Negative (dizziness and disgust)	71 (56.8%)
Cannot remember	29 (23.2%)
Positive (pleasure and happiness)	23 (18.4%)
Nothing	2 (1.6%)
Reason for starting to smoke	
Influenced by somebody	69 (51.9%)
Thought it beautiful	19 (14.3%)
Lit a cigarette for a smoker	12 (9%)
Fun	10 (7.5%)
Toothache	8 (6%)
Stressful life event	8 (6%)
Do not know	5 (3.8%)
Curiosity	2 (1.5%)
Other addictions	
Current drinker	11 (26.8%)
Ex-drinker	26 (63.4%)
Crack and/or marijuana	4 (9.8%)
Medical history	
Hypertension	51 (37.8%)
Depression	13 (9.6%)
Gastritis	9 (6.7%)
Diabetes	7 (5.2%)
Other	39 (28.9%)
No disease	16 (11.9%)

performed using the software Epi Info™ 7. Chi-square or Fisher's exact tests were used to explore associations between the primary predictor variables (demographic, medical and smoking behavior data) and the secondary variables (categories about motivations and reasons for smoking extracted from the CSD). All tests were analyzed using a confidence interval of 95%, and the level of statistical significance was set at $p < 0.05$.

Results

Epidemiological characteristics and tobacco use profile

A total of 135 current smokers of both genders were studied. There were 81 women (60%) and 54 men (40%), with a mean age of 51 years (Table 1). The mean duration of cigarette smoking was 33 years, and the majority of smokers (86.7%) used filter cigarettes; sixteen patients (11.9%) concomitantly smoked filter and hand-rolled cigarettes. Only two patients (1.4%) used hand-rolled cigarettes alone. The average consumption was 29.82 cigarettes per day. Most patients had started smoking in adolescence (58%) and the average age at smoking onset was 16 years (Table 1).

The family history of smoking revealed that 38 patients (29.7%) had both parents who were smokers. Thirty-five patients (27.3%) had fathers and at least one sibling with a history of tobacco use, while only three patients (2.3%) had mothers and siblings who were smokers. Six smokers (4.7%) had exclusively other family members (uncles, aunts, sons, daughters, and spouses) who were smokers. Most of the patients (56.8%) reported that their first experience of smoking was negative, accompanied by events such as dizziness, malaise, and disgust. One portion of the patients (23.2%) reported that they did not remember how their first experience of smoking was, while 23 patients (18.4%) described the occasion as positive, with feelings of pleasure and joy. A minority of smokers (1.6%) reported that they had not felt anything when smoking their first cigarette (Table 1).

When asked why they began smoking, a total of 69 patients (51.9%) reported they had started smoking due to parents' or friends' influence. Nineteen patients (14.3%) declared they started smoking because they "thought it was beautiful", while eight smokers (6%) started smoking after some traumatic

event such as a death in the family, conflicts with spouses, or financial problems. Eight other smokers (6%) reported that during childhood they had toothache and their parents put smoke on the tooth to relieve the pain (Table 1).

Medical data indicated that 37 smokers (27.40%) had a history of alcohol abuse (63.4% were former drinkers, while 26.8% were current drinkers). Only four patients (9.8%) were crack or marijuana users. The smokers' medical history showed that 51 patients (37.8%) had hypertension, 13 (9.6%) had depression, nine (6.7%) had gastritis, and seven patients (5.2%) were diabetics. Thirty-nine smokers (28.9%) reported having other diseases, such as arthrosis, arthritis, fibromyalgia, osteoporosis, pulmonary emphysema, anemia, rheumatism, allergies, and lupus. Sixteen of the participants (11.9%) denied having any type of disease. Most smokers (76.29%) were using some drug, usually for treatment of the diseases described above (Table 1).

Collective discourses relative to motivations for smoking

The motivations for tobacco use were investigated among all smokers through four open questions (Table 2). The smokers' discourses were analyzed and organized according to the CSD method, and are reproduced in Table 2.

Table 2 Collective smoker discourses according to CSD analysis

Question	*N* (%)
What do you seek in a cigarette?	
Relief or emotional comfort	108 (83.7%)
Company	8 (6.2%)
Do not know	8 (6.2%)
Nothing in particular	5 (3.9%)
In what situations do you most want to smoke?	
When anxious, nervous, pre-occupied	89 (71.2%)
Mealtimes	18 (14.4%)
Feeling lonely	7 (5.6%)
When drinking alcohol	4 (3.2%)
Any situation	7 (5.6%)
What do you feel while you are smoking?	
Relaxation, tranquility, relief, pleasure	94 (73.4%)
Dissatisfaction, nervousness, disgust	12 (9.4%)
Anger at yourself	11 (8.6%)
Nothing	7 (5.5%)
Do not know	4 (3.1%)
Why do you smoke?	
Due to stress, anxiety, and nervousness	65 (50.8%)
For pleasure	28 (21.9%)
Not to feel lonely (for company)	6 (4.7%)
Do not know	29 (22.7%)

In response to the question "What do you seek in a cigarette?", 108 smokers (83.7%) said they sought feelings of emotional comfort such as solace and refuge, or relief from anxiety. "*The cigarette for me is an emotional comfort, it comforts me when I am sad. When I smoke the anguish decreases, the cigarette is my emotional crutch. I feel at peace when I smoke. The cigarette for me is everything*". "*I seek to feel relief and tranquility. When I smoke, I feel less nervous and anxious, cigarettes calm me. The cigarette for me is a distraction and a tranquilizer. So it has become a necessity for me, an escape valve*" (Table 2).

For eight patients (6.2%), smoking a cigarette was to make them feel they were not alone, it kept them company (Table 2). "*The cigarette is my companion and a friend at times when I feel lonely. It is a friend and so I do not feel so alone*". Eight other smokers (6.2%) did not know what they were looking for in cigarettes. "*I do not know what I seek in the cigarette, it is addictive*". Five patients (3.70%) said they were not looking for anything in particular in cigarettes: "*I do not seek anything in the cigarette, I just smoke*".

With regard to the question: "In what situations do you most want to smoke?", most smokers (71.2%) reported that they had more desire to smoke in situations involving nervousness, anxiety, and worry. "*I smoke more when I feel anxious and when I do something that does not work. When I think about my problems, I get nervous and in these moments, I seek more cigarettes. If I am worried about a family member or at work, I feel a great desire to smoke. In discussions with my spouse or my children I get very stressed and I smoke more. If I am in financial troubles or someone in my family gets sick, I get more worried and agitated and to calm myself I light a cigarette*" (Table 2).

Eighteen patients (14.4%) felt an increased need to smoke at meal times (Table 2). "*I feel more desire to smoke when I have my daily meals, especially after lunch. I need to light a cigarette before eating and soon afterwards, it is a need I have, and it has become a habit*". Seven smokers (5.6%) reported that they wanted to smoke more when they were alone. "*The desire to smoke is especially stronger when I feel alone, if I am at home alone or when I do not feel supported my family. Then I smoke more. Loneliness occurs when I think about my family members who have died or when my spouse does not give me enough attention*". For seven smokers (5.6%) there was no specific situation that made them smoke more. They felt that they craved smoking in any situation. "*I cannot define in which situations I smoke more. I smoke in any situation and at any time*". Four patients (3.2%) reported that they felt a greater impulse to smoke when they were drinking alcohol. "*The situations in which I most feel the urge to smoke are the times when I am drinking beer. Regardless of where I am, if I am drinking something alcoholic the desire to smoke is strong*" (Table 2).

Relative to the question "What do you feel while you are smoking?", there was a higher prevalence of smokers (73.4%) who declared that they felt good (experiencing relaxation, tranquility, relief, pleasure, satisfaction, calm) when smoking (Table 2). "*When I am smoking I feel relaxed and calm, it seems that the cigarette takes away the sense of weight from my body, it relieves me. Soon I feel the anxiety decreasing and then the pleasure comes. I feel good and satisfied when I smoke; smoking distracts me from my problems. The cigarette is my best friend, it brings me satisfaction and relief*". In contrast, 9.4% of smokers reported they felt bad (dissatisfaction, nervousness, disgust) when smoking: "*The cigarette no longer brings me pleasure, on the contrary I do not like the cigarette smell and it does not satisfy me anymore. That pleasure feeling has gone; I feel dissatisfied and nervous, that makes me smoke even more. I would like to feel the pleasure of smoking again*". Other patients (8.6%) declared that they felt angry with themselves (remorse, regret, failure) while they were smoking: "*Every time I smoke I feel angry with myself, I want to stop smoking, but it is difficult. I feel like a failure by not being able to say no to smoking. When I smoke I feel bad and regretful, but still I cannot stop smoking cigarettes*". Seven patients (5.5%) said they did not feel anything: "*When I am smoking I do not feel anything*" (Table 2).

The results from CSD analysis relative to the last question "Why do you smoke?" showed that the majority of patients (50.8%) reported smoking at times when they felt stressed, anxious, or nervous about something (Table 2). "*What makes me light a cigarette are the times I am stressed or anxious about something. I want to smoke when I feel nervous or agitated about a problem*". However, the results also revealed that 21.9% of patients simply smoked for pleasure or because they liked it: "*I smoke because I like it; it is something that makes me feel good and gives me pleasure*". In contrast, 22.7% of smokers could not identify why they smoked. "*I do not know what makes me smoke; it is an addiction and I do not understand why I keep on smoking*". Finally, 4.7% of patients said that they smoked so that they would not feel alone: "*I smoke so I don't feel alone; I look for company. The cigarette makes me feel good; I do not feel so alone when I am smoking*" (Table 2).

Associations between epidemiological and smoking behavior variables and smoker' discourses

In the next stage, we investigated the correlation between primary variables (epidemiological and smoking behavior) and motivations for tobacco use extracted from the CSD analysis (Table 3). An association was observed between the collective smoker discourses arising from the question "In what situations do you most want to smoke?" and smoking intensity. Of those individuals who reported that they felt more desire to smoke in any situation, 57.1% smoked 21 to 30 cigarettes per day, while of the patients who reported more desire when they felt alone, 71.4% were heavy smokers (more than 30 cigarettes per day) ($p = 0.034$). However, irrespective of the quantity of cigarettes smoked per day, most of the participants (65.9%) felt more desire to smoke in situations that made them feel anxious, worried, or nervous. Another connection was found when smoking intensity was analyzed according to the question: "What do you feel while you are smoking?". Patients who reported feeling angry with themselves when they were smoking smoked less, than patients who reported that they felt nothing or did not know what they felt (these were mostly heavy smokers: 42.9% and 75% respectively) ($p = 0.04$) (Table 3). The collective smoker discourse responses to the question "Why do you smoke?" were significantly correlated with the length of cigarette use. For example, long-term smokers (more than 40 years of smoking) frequently declared that they used cigarettes to feel pleasure, in contrast to the shorter-term smokers (20–40 years of smoking) who mostly reported that they smoked because they felt stressed or anxious (at work or in their relationships) ($p < 0.001$). Moreover, according to replies to the question "Why do you smoke?", CSD analysis revealed that only smokers with a smoking history of over 20 years had mentioned "Not to feel lonely", as the reason for smoking (Table 3). Answers to the question "What do you seek in a cigarette?" did not reveal any associations between the length of tobacco use or smoking intensity ($p > 0.05$) (Table 3). There was, however, a tendency towards a correlation between demographic variables (such as gender and age) and smoker's CSD. For example, relative to the question "What do you seek in a cigarette?" women reported that they more frequently sought cigarettes when they felt alone, while men did not know what to say about what they sought, but this difference did not reach statistical significance ($p = 0.059$) (data not shown). Finally, there were no meaningful associations arising from responses to the open questions "In what situations do you most want to smoke?" and "Why do you smoke?" ($p > 0.05$) and the following variables: cigarette type, age at the first time of using a cigarette, family smoking history, experience with the first cigarette, reason for starting to smoke, occurrence of other addictions, and medical history.

Discussion

The present study showed that emotions and feelings are the main motivational factors related to tobacco consumption and smoking intensity according to smokers' own perceptions. The smokers' discourses extracted by the CSD method showed that states of anxiety, nervousness, and worry were the main emotional factors which induced increased tobacco consumption, and contributed to maintenance of the smoking habit, since it was in times of stress that smokers sought more

Table 3 Associations between length of tobacco use and smoking intensity

Question	Length of use (years)			*P* value	Intensity (cigarettes/day)				*P* value
	Less than 20	20–40	40+		Less than 10	11–20	21–30	30+	
What do you seek in a cigarette?				0.383					0.825
Relief or emotional confort	19 (17.8)	67 (62.6)	21 (19.6)		9 (8.3)	45 (41.7)	18 (16.7)	36 (33.3)	
Company	0 (0)	5 (62.5)	3 (37.5)		1 (12.5)	2 (25)	2 (25)	3 (37.5)	
Do not know	1 (12.5)	5 (62.5)	2 (25)		0 (0)	4 (50)	2 (25)	2 (25)	
Nothing in particular	2 (40)	1 (20)	2 (40)		1 (20)	3 (60)	1 (20)	0 (0)	
In what situations do you most want to smoke?				0.584					0.034*
When anxious, nervous, pre-occupied	15 (17)	58 (65.9)	15 (17)		7 (7.9)	42 (47.2)	13 (14.6)	27 (30.3)	
Mealtimes	3 (16.7)	8 (44.4)	7 (38.9)		2 (11.1)	9 (50)	2 (11.1)	5 (27.8)	
Feeling lonely	1 (14.3)	3 (42.9)	3 (42.9)		1 (14.3)	0 (0)	1 (14.3)	5 (71.4)	
Any situation	1 (14.3)	4 (57.1)	2 (28.6)		1 (14.3)	0 (0)	4 (57.1)	2 (28.6)	
When drinking alcohol	1 (25)	2 (50)	1 (25)		0 (0)	2 (50)	2 (50)	0 (0)	
What do you feel while you are smoking?				0.429					0.040*
Relaxation, tranquility, relief, pleasure	18 (19.1)	58 (61.7)	18 (19.1)		5 (5.3)	39 (41.5)	21 (22.3)	29 (30.9)	
Dissatisfaction, nervousness, disgust	1 (9.1)	9 (81.8)	1 (9.1)		1 (8.3)	6 (50)	1 (8.3)	4 (33.3)	
Anger at yourself	2 (18.2)	5 (45.5)	4 (36.4)		3 (27.3)	7 (63.6)	0 (0)	1 (9.1)	
Nothing	1 (14.3)	3 (42.9)	3 (42.9)		2 (28.6)	1 (14.3)	1 (14.3)	3 (42.9)	
Do not know	0 (0)	2 (50)	2 (50)		0 (0)	0 (0)	1 (25)	3 (75)	
Why do you smoke?				0.0005*					0.104
Due to stress, anxiety, and nervousness	11 (16.9)	48 (73.8)	6 (9.2)		7 (10.8)	28 (43.1)	8 (12.3)	22 (33.8)	
For pleasure	4 (14.8)	9 (33.3)	14 (51.9)		0 (0)	13 (46.4)	4 (14.3)	11 (39.3)	
Not to feel lonely (for company)	0 (0)	4 (66.7)	2 (33.3)		0 (0)	1 (16.7)	3 (50)	2 (33.3)	
Do not know	7 (24.1)	17 (58.6)	5 (17.2)		4 (13.8)	10 (34.5)	9 (31)	6 (20.7)	

*Values considered statistically significant at $p < 0.05$ (Chi-square and Fisher's exact tests)

cigarettes. For most of the patients, smoking provided relief from these feelings. Moreover, the patients reported that when they were smoking they felt relaxed, calm, tranquil, and even satisfied, reinforcing the role of smoking as a factor promoting emotional comfort. Smoking promoted a feeling of ease and relief from distress and anxiety. In view of our results and in line with other investigations, we concluded that smokers use cigarettes as a way to control emotions and feelings (West and Hajek 1997; Lennon et al. 2005; Brandt et al. 2015). Generally speaking, smoking prompts relaxation when tension and anxieties arise in smokers (Brandt et al. 2015). The relaxation reported by smokers can be attributed to the effects of nicotine on the human brain. Nicotine may increase states of cerebral excitation, acting on specific receptors which release neurotransmitters, especially dopamine, responsible for the sensation of pleasure and well-being. Thus, smoking not only produces a general state of relaxation, but may also influence the decrease levels of stress and anxiety, producing a sensation of relief. Therefore, cigarette consumption is considered a motivating factor for the smoker (Di Chiara et al. 2004; Brandt et al. 2015; Pistillo et al. 2015).

The maintenance of this addiction further expands the motivation for using the cigarette as a way to control emotional states, thus, smoking becomes present not only in times of stress, but also in times of sadness and loneliness (Cacioppo and Cacioppo 2014; Cacioppo et al. 2014; Dyal and Valente 2015). Interestingly, our results revealed that higher smoking intensity was also correlated with feelings of loneliness as expressed in the CSD, so that the patients who smoked more were also those who felt more alone. However, these results should be viewed with caution due to the small number of patients who reported feel lonely. Nevertheless, the feeling of solitude has been associated with smoking (Ahmad 2015). Loneliness leads to a state of emptiness, which in turn can cause distress (Ahmad 2015). In other words, for many smokers the cigarette has the function of a companion (Mahon et al. 2006; Gilman et al. 2009; Schwab 2011; Mays et al. 2014; Ahmad 2015; Stanton et al. 2015). In general, our findings showed a very low occurrence of blank or evasive responses to the open questions about motivations for smoking. However, some smokers who smoked more than 30 cigarettes per day (heavy smokers) failed to identify what they felt when they were smoking, compared with light or moderate smokers who were better able to express or describe one or more feelings. However, these findings were of minor importance, since only three participants failed to define what they felt

when they were smoking. Future studies are needed to explore the association between psychological unconscious and smoking addiction.

In the present study, in addition to the objective data about behavior and history of smoking, we used four open questions and the CSD method to explore the motivations and feelings related to tobacco use according to smokers' own perceptions. Although the interview-based approach is widely used in research, with the goal of evaluating factors related to tobacco and other drugs (Kassel and Shiffman 1997; Booker et al. 2008; Borges and Simões-Barbosa 2008; Fidler and West 2009; Schuck et al. 2012; Amos et al. 2012; Choi et al. 2015), no study to date has used CSD analysis (and crossed the results with objective smoking behavior data) for investigating motivational factors associated with the maintenance of smoking. One of the advantages of the CDS analysis is the possibility of capturing data which express what the patient is really thinking or feeling at the specific moment relative to the issue being researched. Along this line, CSD analysis synthesize the answers into a collective central ideal (Fidler and West 2009; Amos et al. 2012). This methodological characteristic reinforces the importance of the present study's findings, which were mainly taken from the adult smokers' own perceptions, emotions, and feelings, and which revealed the major factors influencing smoking maintenance and intensity.

With regard to study limitations, we were aware that since we used an interview-based approach through open questions, some of the participants experienced a natural difficulty when talking about their feelings or thinking about the real motives for their addiction. Therefore, we did not conduct further in-depth exploration of specific events or psychological mechanisms related to emotional factors when the patients pointed out these issues as the cause of their cigarette use or the reason for increasing their consumption.

Given the results of the present study, we can ascertain that cigarettes play an important role in helping smokers to cope with stressful events and find relief from negative feelings. Based on smokers' discourses, smoking is considered a positive strategy to handle events related to anxiety, nervousness, and worry, such as occur in family discussions, marital problems, and financial difficulties. Although patients are aware of the harm caused to themselves and others by smoking, the positive emotional effects that smoking produces, such as satisfaction, relaxation, relief, and tranquility, are nevertheless factors that reinforce the maintenance of smoking. The findings of the present study demonstrate that emotions and feelings are the motivational basis for cigarette use from the smokers' own perception. Thus, strategies for detecting and supporting emotional factors may be critical for the prevention and treatment of smoking.

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Compliance with ethical standards

Conflict of interest The authors declare that they have no conflict of interest.

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