ORIGINAL ARTICLE

Coping strategies for craving management in nicotine dependent patients

Estratégias de enfrentamento da fissura em dependentes de nicotina

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Abstract

Objective: *The aim of this study was to investigate the association between the intensity of craving and the types of coping skills used by nicotine-dependent patients.* ***Method:*** *This was an experimental study. The sample comprised 201 subjects, mean age 38.15 years. The participants were randomly divided into groups of zero, 30 and 60 minutes of nicotine abstinence. The following instruments were administered: the Chart of Sociodemographic Data, the Fagerström Test for Nicotine Dependence, the Questionnaire of Smoking Urges, and the Coping Strategies Inventory.* ***Results:*** *The most frequently used coping strategies are presented in descending order: accepting responsibility, self-control and distancing. There was a positive correlation between the confrontive coping strategy and the total score on the Questionnaire of Smoking Urges (rs = 0.146; p = 0.045) and the score on Factor 1 (rs = 0.165; p = 0.023).* ***Conclusion:*** *The most intense craving can lead nicotine-dependent individuals to use confrontive coping strategies that make them unable to control their emotions or to face the situations of high risk of relapse. This finding demonstrates that the treatment of smokers should include psychological education about the pitfalls of using these types of strategy and should teach them new types of coping strategies for craving management.*

Descriptors: *Questionnaires; Tobacco; Nicotine; Treatment; Patient*

Resumo

Objetivo: *O objetivo deste estudo foi investigar a associação entre a intensidade do* craving *e os tipos de habilidade de* coping *utilizados por dependentes de tabaco.* ***Método:*** *Estudo experimental. A amostra foi de 201 sujeitos, com uma média de idade de 38,15 anos. Os participantes foram divididos, aleatoriamente, em grupos de zero, 30 e 60 minutos de abstinência do tabaco. Os instrumentos aplicados foram uma ficha com dados sociodemográficos,* Fagerström Test for Nicotine Dependence, Questionnaire of Smoking Urges *e Inventário de Estratégias de* Coping*.* ***Resultados****: As estratégias de* coping *mais utilizadas, em ordem decrescente, foram aceitação de responsabilidade, auto-controle e distanciamento. Foram encontradas correlações positivas entre a estratégia de confrontamento e total de pontos do* Questionnaire of Smoking Urges *(rs = 0,146; p = 0,045) e pontos no Fator 1 (rs = 0,165; p = 0,023).* ***Conclusão:*** *O* craving *mais intenso pode levar o dependente a utilizar estratégias de confrontamento que são pouco eficientes na contenção das emoções e no enfrentamento das situações de risco de recaída. Este achado é relevante, pois demonstra que, no tratamento de tabagistas, é preciso psicoeducar os pacientes para os riscos da utilização deste tipo de estratégia e ajudá-los para que utilizem novos tipos de estratégias de* coping *para o manejo do* craving*.*

Descritores: *Questionários; Tabaco; Nicotina; Tratamento; Paciente*

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Introduction

Craving, which is an intense desire to use a specific substance, is a term frequently used in the field of substance dependence. Craving is also an important variable in the treatment of nicotine-dependent patients[1-5] and nicotine is the subject of this study.

Recent studies have supported the idea that craving cannot be underestimated and considered restrictively as a "desire" to use a substance since it also includes: the intention of satisfying this desire, the anticipation of the positive effect related to the substance use, and, in nicotine users, as a manner of relieving the symptoms of abstinence or negative affect.[6-10] Some authors differentiate craving (the "intense desire" to use a substance) from "urge" (the impulse to use it).[3]

Many nicotine-dependent individuals report that the difficulty in ceasing tobacco use is related to the inability to deal with nicotine craving and resist the temptation of using it, even though they are aware of the harm related to this behavior.[11] These factors and their synergism have an influence on the individuals' motivation to quit smoking.[12]

From the factors that lead the individual to use nicotine, the craving cannot be controlled; however, the urge might be voluntarily controlled even when the individual feels unable to do so. The desire to avoid the substance use has an important cognitive element: the decision-making process. Such self-control is not expressed in a visceral manner as the craving is; therefore, these motivations are opposed and qualitatively different.[2] Coping strategies are the skills that need to be developed so that one can control stressful situations and get adapted to them.[13] Once the craving may be considered a stressor, the study of the coping strategies for craving management can be very useful in the treatment of nicotine-dependent individuals.[14-19]

Coping strategies play an important role in the success of tobacco use cessation; however, few studies have been carried out on the use of these strategies for the management of nicotine craving.[20]

On the other hand, the training of individuals in the use of coping strategies is often provided in treatment programs for smokers. In general, people who use these strategies are more often successful when trying to quit smoking than those who do not use them. In other words, the individuals who are able to quit cigarette smoking are the ones who feel less craving and use more coping strategies for craving management.[21]

Slama, Chiang and Enarson have suggested that the use of coping strategies for craving management – both cognitive (such as those related to motivation) and behavioral (such as seeking social support) – helps smokers remain abstinent.[22]

A study that has assessed subjects during the first 10 days of abstinence has found that each individual used a mean of 2.7 coping strategies per episode when dealing with nicotine craving, being 67% of behavioral responses and 33% of cognitive responses. The subject's gender, the place where the episode happened, the severity of nicotine dependence, and the history of previous attempts to remain abstinent were associated with the use of specific strategies.[20]

Even though coping strategies are related to cognitive and behavioral factors, they are also related to physiological factors. Evidence has come from a clinical trial which compared cognitive behavioral therapy associated with nicotine replacement therapy to cognitive behavioral therapy without pharmacological support, and concluded that the group receiving the combined therapy used more coping strategies to deal with craving and negative emotions and presented lower levels of anxiety, fatigue and tension.[23]

The coping strategies more often used by smokers are deep breathing, cognitive strategies, food intake and physical activities. In a comparison between subjects who remain abstinent for one year and those who relapse before this period of time, the results have shown that the former need less coping strategies, however, even during abstinence, they continue to consider these strategies as relevant for relapse prevention.[24]

Understanding the interaction between craving and coping strategies is especially important for the clinical treatment of substance-dependent patients, since it might be helpful in achieving better rates of abstinence maintenance. Therefore, the objective of this study was to investigate the association between the intensity of the craving (according to the duration of nicotine withdrawal) and the types of coping skills used by nicotine-dependent patients.

Method

This study was approved by the Research Ethics Committee of the Pontifícia Universidade Católica do Rio Grande do Sul (PUCRS). The data were collected only after each subject was informed about the procedures and the objectives of this study and after two copies of the Informed Consent were signed so subjects could keep one copy of their signed Consent.

1. Design

This was an experimental study. The variable craving was measured according to the duration of nicotine withdrawal.

2. Subjects

The sample comprised 201 subjects from the general population of Porto Alegre, a city located in the Southern region of Brazil. The subjects were recruited by convenience sampling, assessed by the Snowball Sampling Method. Participants were randomly allocated into the groups.

There were male (n = 67) and female (n = 134) participants, who met the ICD-10 criteria for tobacco dependence.[25] All sample had smoked at least more than 100 cigarettes during their lifetime. They had been using tobacco for at least 1 year (M = 21.41 years; SD = 12.4); their lowest schooling level was 5 years of school attendance (M = 12.2 years; SD = 2.74), and they aged between 18 and 65 years (M = 38.15; SD = 11.93). The subjects smoked an average of 17.17 cigarettes a day (SD = 11.0), and their mean score on the Fagerström Scale was 4.14 (SD = 2.58), which is considered by Achutti[26] as mild smoking. With respect to the subjects' motivation to cease tobacco use, 14 individuals did not intend to quit smoking, 133 reported they were willing to quit "some day", 11 were willing to quit in the coming year, 17 reported they would do it in the coming month, nine intended to quit in the coming week, 15 would try to quit smoking at the end of that day, and this information was missing for two subjects.

In addition, according to the ICD-10,[25] the subjects were not addicted to, or made "harmful use" of, any other psychoactive substances, except for caffeine. They did not use any type of psychiatric drugs, had not been in nicotine abstinence for more than 24 hours, and had not attempted to cease tobacco use in the past.

3. Instruments

A Chart of Sociodemographic Data was used to assess social and demographic characteristics related to the inclusion of individuals in the sample, as well as factors associated with the use of tobacco.

Questionnaire of Smoking Urges (QSU) – Brazilian Version[6] - This scale was designed by Tiffany and Drobes[10] and validated for

different cultures due to its usefulness.[27-30] It contains 32 items that consist of 19 affirmative and 13 negative statements related to different concepts of tobacco craving. Its scoring is based on a seven-point Likert-type scale (1 = strongly disagree; 7 = strongly agree), and it can be assessed by its total score and by the score on Factor 1 (which assesses the elements of craving: smoking desire, relief of abstinence symptoms or negative affect and, less intensely, the intention of smoking) and Factor 2 (which assesses the following elements of craving: anticipation of positive effect, smoking desire, and intention of smoking, which is more relevant for the first factor). Using the following cutoff points, the total scores on the QSU are classified as: minimum craving level, from 0 to 64 points; mild craving, from 65 to 98 points; moderate craving, from 99 to 139 points, and intense craving, equal to, or higher than, 140 points.

Fagerström Test for Nicotine Dependence (FTND) – Brazilian version validated by Carmo and Pueyo.[31] This scale was designed by Fagerström[32] and readapted by Healtherton et al.,[33] and consists of questions related to the typical smoking pattern, which classifies nicotine dependence into mild, moderate or severe.

Coping Strategies Inventory[34] - Brazilian version adapted and validated by Savoia, Santana and Mejias.[13] This instrument assesses 66 coping strategies for a specific situation. In this study, the situation chosen was "the craving when the individual cannot smoke or does not want to smoke". In this scenery, the subject has to choose one out of the following answers to rate each specific coping strategy: 0 – I do not know this strategy, 1 – I used this strategy a few times, 2 – I often used this strategy, and 3 – I used this strategy very often. The following coping strategies are grouped into the following dimensions: confrontation (Factor 1), distancing (Factor 2), self-control (Factor 3), social support (Factor 4), accepting responsibility (Factor 5), escape and avoidance (Factor 6), problem solving (Factor 7) and positive reappraisal (Factor 8). In the present study, the strategies were also divided into cognitive (38 strategies) and behavioral (28 strategies) and the number of strategies each participant reported to use for craving management was assessed, zero being the minimum and 66 being the maximum possible number of strategies, which is the total number of questions in the scale.

4. Data collection

Participants who met the inclusion criteria were individually assessed and their information was recorded in the Chart of Sociodemographic Data.

The sample was randomly divided into three subgroups: Group 1, 0-minute withdrawal, Group 2, 30-minute withdrawal, and Group 3, 60-minute withdrawal. The objective of this division was to obtain different levels of craving according to duration of the withdrawal period.

Those subjects who met all inclusion criteria, accepted to participate in the study and signed the informed consent form left the interview room so that they could smoke, making it possible to assess the exact moment at which the substance was used, and, soon after that, all the instruments were administered. The order of administration of the QSU (instrument that assesses the craving) was determined based on each participant's group. The QSU could be completed in the beginning (Group 1), in the middle (Group 2) or at the end of the battery of questionnaires (Group 3).

5. Data analysis

All the information collected was organized in the Statistical Package for the Social Sciences (SPSS), version 12.0. The exploratory data analysis consisted of descriptive statistical tests and frequency tests. The Kolmogorov-Smirnov test was used to assess if the variables distribution fit a normal curve. The chi-square test was employed in order to check the association between categorical variables; the Mann-Whitney test, the Spearman Linear Correlation Coefficient (rs) and the Kruskal-Wallis test were used to assess the associations related to the variables "coping strategies" that did not have a normal distribution, and the Analysis of Variance (ANOVA) and the Tukey's test were chosen to check the associations in the other variables that had normal distribution. The level of significance was set at 5%.

Results

The whole sample (n = 201) was randomly distributed in three groups as follows: Sixty-nine subjects were allocated in Group 1 (0-minute withdrawal), 60 subjects were in Group 2 (30-minute withdrawal), and 71 subjects were allocated in Group 3 (60-minute withdrawal).

The results from ANOVA comparisons are described in Table 1, and the findings show that there was no significant difference among the groups with respect to all the characteristics analyzed, except for those related to craving, that varied according to the duration of withdrawal as expected.

Regarding the variable gender, in Group 1, 24 subjects were males and 46 were females, in Group 2, there were 20 men and 40 women, and, in Group 3, 23 subjects were males and 48 were females. There was no significant difference between experimental

Table 1 – Characterization of the sample at different lengths of abstinence*

Variables	0 minutes	30 minutes	60 minutes	*f*	P
Age	39.29 (11.52)	39.15 (11.19)	36.20 (12.81)	1.49	0.229
Years of schooling	12.33 (2.70)	12.28 (2.56)	12.00 (2.74)	0.29	0.748
Cigarettes/day	18.66 (11.53)	18.00 (12.04)	15.00 (9.21)	2.22	0.111
Age at onset of tobacco use	16.46 (4.34)	16.61 (3.39)	17.56 (5.83)	1.12	0.329
Duration of tobacco dependence	22.83 (12.15)	22.76 (11.65)	18.89 (13.03)	2.28	0.105
Number of attempts to quit tobacco use	2.15 (2.36)	1.91 (2.27)	1.92 (1.85)	0.26	0.771
Previous treatments for smoking dependence	0.16 (0.37)	0.10 (0.30)	0.10 (0.35)	0.66	0.518
Fagerström Scale	4.16 (2.81)	4.45 (2.33)	3.86 (2.53)	0.86	0.426
QSU – Total Score	90.33 (36.89)	107.12 (46.28)	119.56 (52.53)	7.22	0.001**
QSU – Factor 1	38.29 (20.33)	46.35 (26.38)	54.32 (29.59)	6.86	0.001**
QSU – Factor 2	47.67 (19.77)	55.05 (22.77)	58.00 (22.77)	4.18	0.017**

** Means (SD)*
***According to the Tukey's test, there was a statistically significant difference in the intensity of craving (QSU: Total score, Factors 1 an 2) only between 0- and 60-minute abstinence.*

Table 2 – Comparison of the coping strategies at different lengths of abstinence*

Variables	0 minutes	30 minutes	60 minutes	p
Number of strategies	34.94 (14.81)	33.89 (15.52)	31.69 (15.04)	0.675
Cognitive	20.99 (8.33)	20.03 (9.51)	19.32 (9.25)	0.665
Behavioral	13.84 (7.18)	14.02 (6.40)	12.59 (6.54)	0.907
Confrontative	3.84 (3.43)	4.71 (4.99)	3.37 (3.02)	0.481
Distancing	5.25 (3.19)	5.29 (3.71)	5.55 (3.55)	0.897
Self-control	6.10 (3.22)	5.37 (3.24)	5.90 (3.37)	0.372
Social support	4.53 (3.73)	4.14 (3.46)	3.48 (3.07)	0.598
Accepting responsibility	7.69 (4.51)	7.47 (4.54)	6.71 (4.69)	0.960
Escape-avoidance	2.10 (2.09)	2.00 (1.93)	1.77 (1.77)	0.909
Problem solving	4.30 (2.74)	4.31 (2.74)	4.47 (3.27)	0.910
Positive reappraisal	8.09 (6.41)	8.00 (6.58)	6.97 (5.55)	0.884

** Means (SD)*

groups regarding gender frequency (χ^2 = 0.057; p = 0.972). Groups also did not differ regarding motivation to cease tobacco use (χ^2 = 12.30; p = 0.266).

Results regarding the use of coping strategies according to duration of withdrawal are shown in Table 2 (Kruskal-Wallis test).

No statistical difference was found between genders regarding the number of coping strategies used (Mann-Whitney test, U = 3458.5; p = 0.268), as well as the amount of cognitive strategies (U = 3599.5; p = 0.299) and behavioral strategies (U = 3542; p = 0.342).

No correlation was found between the coping strategies for craving management and the variables related to nicotine dependence, such as: subjects' age when they began using tobacco, number of cigarettes smoked a day, severity of dependence, number of attempts to quit smoking, and number of treatments undertaken (Spearman Linear Correlation Coefficient - rs). There was a very low positive correlation between the severity of dependence assessed using the Fagerström Scale and the distancing strategy (rs = 0.164; p = 0.024); and there were also very low positive correlations |35| between the number of treatments to quit smoking and: number of coping strategies (rs = 0.158; p = 0.031), number of cognitive strategies (rs = 0.147; p = 0.043) and behavioral strategies (rs = 0.157; p = 0.032); as well as the use of the seeking social support strategy (rs = 0.234; p = 0.001); the self-control strategy (rs=0.169; p = 0.020) and the escape and avoidance strategy (rs = 0.159; p = 0.028). There were no positive or negative correlations to the other coping strategies.

With respect to the distribution of subjects according to the intensity of craving in the whole sample (n = 201), we found that 25.4% of the subjects had a minimum level of craving, 24.4% had a mild level, 25.4% had a moderate level and 24.4% presented with an intense level of craving. Data were missing for one case.

The Spearman Linear Correlation Coefficients between craving intensity and type of coping strategy are shown in Table 3.

Discussion

The scientific community has been promoting the debate on the role of craving as one of the most important triggering factors of lapses and relapses in substance-dependent individuals,[36] and, more specifically, in nicotine-dependent subjects.[5] Therefore, it is extremely important to study the coping strategies for craving management,[14-18] as well as the factors related to these strategies.[12]

In our study, the three groups did not present significant differences in terms of the variables possibly associated with craving, such as length of tobacco use, severity of dependence, attempts to cease tobacco use, and previous treatments for nicotine dependence, which makes our finding consistent with craving variations based on the different periods of nicotine abstinence, since these variables did not have an influence on the results. On the other hand, with regard to craving, there was a significant difference among the three groups as expected: the longest the abstinence period, the most intense the craving. Previous studies with homogeny groups of patients have obtained similar results after comparing the craving in different groups using the duration of withdrawal as a criterion.[6,7,10]

In the present study, there were no differences regarding the coping strategies at different periods of withdrawals; however, when the direct associations with craving were analyzed, we found that the confrontive coping strategy was correlated with the total score on the QSU and the score on Factor 1. This type of strategy is related to the individuals' ability to express emotions or face up the risk of relapse.[13] According to our results, intense craving - either in its general aspect (total score) or in terms of its elements such as urge to smoke, relief of symptoms of abstinence or negative affection, and

Table 3 – Correlations between craving and coping strategies

Variables	Total Score on the QSU	QSU – Factor 1	QSU – Factor 2
Number of strategies	0.091	0.118	0.040
Cognitive	0.087	0.116	0.050
Behavioral	0.080	0.102	0.022
Confrontive	0.146*	0.165*	0.106
Distancing	0.053	0.090	0.018
Self-control	-0.084	-0.046	-0.116
Social support	-0.039	0.007	-0.080
Accepting responsibility	-0.090	-0.094	-0.103
Escape-avoidance	0.070	0.137	0.012
Problem solving	-0.099	-0.119	-0.108
Positive reappraisal	-0.010	-0.023	-0.029

** p < 0.05*

intention of smoking (Factor 1) - can cause the nicotine-dependent individuals to have difficulties to control their emotions or to face up the risk of relapse regardless of the consequences. Previous research has shown that it is probably due to the fact that subjects with substance dependence might experience a cognitive blocking.[2] This finding is relevant because it demonstrates that the treatment of smokers should include psychological education about the pitfalls of using this type of strategy[37] and should teach patients how to use new types of coping strategies in order to manage craving.

With respect to the coping strategies, the following were the most frequently used according to the scores of the Coping Strategies Inventory (in a descending order): accepting responsibilities (M = 7.29), self-control (M = 5.79) and distancing (M = 5.36). Such finding is not in agreement with the result described by O'Conell et al.[24]

When comparing the genders regarding the coping strategies, there was no significant difference about the number of coping strategies used (U = 3458.5; p = 0.268), as well as the amount of cognitive strategies (U = 3599.5; p = 0.299) and behavioral strategies (U = 3542; p = 0.342), which are also in disagreement with what O'Conell et al have demonstrated.[20]

Coping strategies for craving management and few variables related to tobacco dependence were shown to be correlated with a low predictive value.[35] The severity of dependence was correlated with the score for the use of distancing as a coping strategy (rs = 0.164; p = 0.024). This finding replicates the results obtained by O'Conell et al.,[20] about the association between the severity of nicotine dependence and the use of specific strategies for craving management.

On the other hand, the number of treatments to quit smoking, was correlated with the number of coping strategies, the number of cognitive and behavioral strategies and the use of seeking social support, self-control and escape and avoidance strategies. This finding provides further evidence that treatments efficiently improve the patients' self-efficacy by teaching them several and different coping strategies for craving management.[21-23]

This study had some limitations: 1) psychiatric comorbiditidy wasn't evaluated and could have influenced the craving scores; 2) the sample had a high schooling level that could interfere with choice of coping strategies; 3) we chose to use a convenience sample that might increase the probability of type I error; 4) and although correlation analysis yielded significant results according to a p value lower than 0.05, only weak correlation coeficients were found in this study.

Further studies should aim at coping strategies for craving management as it is an important issue for every professional who works with substance dependence and might be associated with higher abstinence maintenance rates by increasing the patients' self-efficacy.

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Writting group member	Employment	Research grant[1]	Other research grant or medical continuous education[2]	Speaker's honoraria	Ownership interest	Consultant/ Advisory board	Other[3]
Renata Brasil Araujo	Hospital Psiquiátrico São Pedro	CAPES*	-	-	-	-	-
Margareth da Silva Oliveira	PUCRS	CAPES*	-	-	-	-	-
Rosemeri Siqueira Pedroso	Faculdades São Camilo	-	-	-	-	-	-
Maria da Graça Tanori de Castro	Instituto Abuchaim	-	-	-	-	-	-

** Modest*
*** Significant*
**** Significant. Amounts given to the author's institution or to a colleague for research in which the author has participation, not directly to the author.*
Note: PUCRS = Pontifícia Universidade Católica do Rio Grande do Sul; CAPES = Coordenação de Aperfeiçoamento Pessoal de Nível Superior.
For more information, see Instructions for authors.

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