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QUALITY OF LIFE, ANXIETY AND DEPRESSION AFTER A SMOKING CESSATION PROGRAM

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ABSTRACT: Objective to describe quality of life, anxiety and depression in patients before and after participating in a smoking cessation program in two Basic Health Units in the municipality of Belo Horizonte, State of Minas Gerais. This was a prospective cohort study, in which 76 patients were interviewed before and after participating in the program, through questionnaires with items about anxiety and depression measured through *Hospital Anxiety and Depression Scale,* and about quality of life evaluated by the *WHOQOL-bref scale* and about tobacco use. The proportion of smoking cessation after the program was 85.5%. There was a significant increase in score for overall quality of life ($p=0.041$) and a decrease in depression levels ($p<0.001$). After the program, there was an improvement in patients' quality of life and depression levels.

KEY WORDS: Cognitive behavioral therapy; Health education; Pharmaceutical services; Primary health care; Tobacco use cessation.

QUALIDADE DE VIDA, ANSIEDADE E DEPRESSÃO APÓS UM PROGRAMA DE CESSAÇÃO DE TABAGISMO

RESUMO: O objetivo deste trabalho é descrever a qualidade de vida, ansiedade e depressão de usuários pré e pós exposição a um programa de cessação do tabagismo em duas unidades básicas de saúde do município de Belo Horizonte (MG). Trata-se de um estudo de coorte prospectivo, em que 76 usuários foram entrevistados antes e após a participação no programa por meio de questionários, em que foi empregada a escala *Hospital Anxiety and Depression Scale* para avaliar níveis de ansiedade e depressão, a escala *WHOQOL-bref* para verificar qualidade de vida, além de itens relativos ao uso de tabaco. A proporção de cessação do tabagismo ao fim do programa foi de 85,5%. Observou-se aumento significativo no escore da qualidade de vida geral ($p = 0,041$) e diminuição nos níveis de depressão ($p < 0,001$). Desse modo, após a participação no programa, observou-se melhoria na qualidade de vida e no nível de depressão dos pacientes.

PALAVRAS-CHAVE: Abandono do uso de tabaco; Assistência farmacêutica; Atenção primária à saúde; Educação em saúde; Terapia cognitivo-comportamental.

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INTRODUCTION

Chronic tobacco use increases the risk of tobacco related diseases, accounting for 63% deaths associated with chronic non-communicable diseases (NCDs). Of these, smoking is responsible for

85% deaths from chronic lung disease, 30% from cancer, 25% from coronary disease and 25% from cerebrovascular diseases, in addition to the increased risk of becoming ill and dying from communicable diseases, such as tuberculosis and lower airway respiratory infections.[1]

Smoking is considered an epidemic disease due to nicotine dependence and is included in the 10th International Classification of Diseases (ICD10) in the group of mental and behavioral disorders due to the use of psychoactive substances. Nicotine, seconds after dragging the product, reaches the reward system, stimulating the sensation of pleasure, improving cognition, controlling negative stimuli and emotions, reducing anxiety and symptoms related to depression. This process generates a positive reinforcement and the need to repeat use, bringing the risk of addiction.[2]

Smokers, when compared to non-smokers, have a worse grasp on issues related to social, psychological, physical aspects, as well as worse quality of life (QoL).[3] Nicotine-dependent users are about two to eight times more likely to develop disorders of anxiety and depression when compared to sporadic smokers, ex-smokers and individuals who have never smoked.[4] In addition, smoking and physical inactivity have been cited as precursor behaviors for mental disorders.[5,6]

Among the instruments used to assess quality of life, there is the WHOQOL-bref, developed by the World Health Organization (WHO) and which analyzes QoL in general and includes these several dimensions: physical, psychological, social relations and environment.[7] Higher scores in the WHOQOL-bref indicate a better perception of people about their quality of life.[7] According to a study carried out with the population user of four Basic Health Units (BHU) in Belo Horizonte, State Minas Gerais, smoking individuals had lower scores in all domains of quality of life in the WHOQOL-bref questionnaire compared to nonsmokers.[8] Another study illustrated an inverse association between the level of tobacco dependence and all domains of quality of life assessed by the WHOQOL-bref, especially the physical and environmental dimensions.[9]

Nicotine addiction is composed of behavioral, physiological and psychological elements, which should also be achieved in order for the individual to quit smoking and, above all, to remain tobacco free.[10] Counseling and the use of medications can increase success by more than 50% for a smoker who wants to stop using tobacco.[10] Cognitive Behavioral Therapy (CBT) is an intervention in the smoking cessation process that aims to: help in understanding the relationship that each smoker establishes with the cigarette and the reasons why maintains consumption, learn skills that allow the recognition of risk situations and better cope with them and offer strategies to prevent relapse.[11]

According to a study carried out in Greece[12] with individuals who participated in a smoking cessation program, there was a significant increase in the perceived levels of quality of life after treatment, measured by the EuroQol instrument (EQ-5D), in addition to the improvement in depression scores. Studies in Brazil[13] and Spain[14] also showed improvements in the symptoms of depression after participating in interventions to quit smoking. In a Brazilian study that evaluated the effect of CBT combined with pharmacotherapy, there was also an improvement in anxiety scores after the participation of smokers in a smoking cessation program.[13]

The treatment of smoking is primarily carried out at Primary Health Care (PHC), a level of strategic attention to guarantee comprehensiveness, longitudinality and coordination and ordering of care. In view of the magnitude of the costs involved in the treatment of tobacco-related diseases, the negative collective, social, environmental and family impact of smoking and the complexity of addiction, the need to develop interventions for smoking cessation is clear. The evaluation of the impact of programs to quit smoking on improving the quality of life and the symptoms of depression and anxiety is important for redirecting and qualifying actions to control nicotine addiction. Few studies have addressed the association between participation in smoking cessation programs and improvement in quality of life, anxiety and depression[12-14] and only one included a PHC unit in the studied sample.[13]

The present study aimed to describe and compare the quality of life, anxiety and depression of users before and after participating in a smoking cessation program in two Basic Health Units (BHU) in the municipality of Belo Horizonte, State of Minas Gerais. The hypothesis tested was that smokers improve their quality of life, anxiety and depression scores after participating in the smoking cessation program.

METHODOLOGY

DESIGN, SAMPLE AND CONTEXT OF THE STUDY

This was a prospective cohort study carried out with 76 smokers from two Basic Health Units (BHU) in the city of Belo Horizonte, State of Minas Gerais, Brazil. The age of the patients ranged from 22 to 73 years, with a mean of 54.1 years (standard deviation of 11.1 years) and 72.4% were female.

Samples were selected by non-probabilistic convenience sampling, and included users who sought the smoking cessation service between December 2016 and July 2017. The minimum sample size was calculated using the OpenEpi software, considering a 5% significance level and a 95% confidence interval and resulted in a minimum of 72 users.

Eligibility criteria consisted of being a smoker interested in quitting smoking, being 18 years of age or older, having a telephone number for contact and having signed the Informed Consent Form (ICF). As an exclusion criterion, the occurrence of a characteristic that prevented the collective approach was adopted, such as: presence of cognitive decline, neuropsychiatric disorders, chemical dependencies, as recommended in a previous study.[11] A consultation was made in the electronic medical record of users who sought the cessation program to verify the presence of exclusion criteria.

The program consisted of 10 structured meetings, over a six-month follow-up. Following Brazilian guidelines, pharmacological treatment and cognitive-behavioral therapy (CBT) were offered.[2]

INSTRUMENTS AND VARIABLES

Two interviews were conducted, applied before the beginning and after the program sessions, called initial assessment and final assessment. For the interviews, a questionnaire was used that included the following independent variables:

Sociodemographic variables: sex (male or female), education level (elementary, high school and higher education), presence of professional occupation (yes or no) and age in years, which was classified into three classes: 18 to 39 years, 40 to 59 years and 60 years or more.

Variables of health conditions and lifestyle habits: self-reported diseases (high blood pressure and diabetes), use of pain medications in the last 15 days (yes or no), alcohol consumption (yes or no) and physical activity (yes or no).

Clinical variables: assessment of the level of anxiety and depression (HADS - Hospital Anxiety and Depression Scale[15], composed of 14 questions with a score from zero-improbable to 21-probable); level of nicotine dependence (FTND - Fagerstrom Test for Nicotine Dependence[16], with 6 questions, on a scale from 0 to 10, being: 0-2 points, very low dependence; 3-4 points, low dependence; 5 points, medium dependency; 6-7 points, high; and 8-10 points, very high nicotine dependence) and quality of life assessment (WHOQOL-bref-World Health Organization Quality of Life scale[7], with 26 items, two regarding the overall quality of life and the others included in the physical, psychological, social relationships and environmental domains). Scores of overall QOL and their domains were calculated based on the Manual "Whoqol-Bref Introduction, Administration, Scoring And Generic Version Of The Assessment".[17]

DATA COLLECTION

Data collection took place between March and December 2017. After the initial assessment questionnaire, eligible users were invited to participate in raising awareness about the conduct of the program.

Participation in raising awareness served as a requirement for the assessment of the medical professional to determine the pharmacological treatment according to the clinical indication and for permanence in the program sessions. At the end of the sessions, the user was again invited to answer the final assessment questionnaire. Six months after the end of the sessions, a self-report on maintaining abstinence was verified via telephone contact for the participants who answered the final assessment questionnaire.

DATA ANALYSIS

Descriptive analysis was performed by calculating frequencies for categorical variables and measures of central tendency and variation for continuous variables.

For statistical tests of comparison of means, samples were considered as paired. The definition of paired samples is used to measure variables in groups of individuals evaluated before and after intervention.

Therefore, in addition to the summary measures, tests were performed to assess the normality of continuous data, however, the variables did not show normal distribution (Anderson-Darling test, alpha = 5%). Thus, it was decided to use non-parametric tests according to the characteristics of the data and the sampling design.

Thus, the Wilcoxon-test for paired samples was applied for the continuous variables measured before and after intervention, and the McNemar test was used to test the categorical variables. All analyses were performed considering a significance level of 5%. The SPSS 21.0 software (Statistical Package for the Social Sciences) was used.

ETHICAL ASPECTS

The research project was approved by the Ethics Committee of the Federal University of Minas Gerais on 06/03/2017 (Opinion 1961698, CAAE: 63775716.0.0000.5149) and by the Research Ethics Committee of the Belo Horizonte Municipal Health Department on 25/04/2017 (2.031.273, CAAE: 63775716.0.3001.5140). All participants included in the survey completed and signed the Informed Consent Form (ICF).

RESULTS

The study was designed to obtain information from the 76 eligible patients who were assessed by the initial questionnaire. However, at the end of the program, 55 users were present during the six-month follow-up, and answered the final assessment questionnaire. The withdrawal of 21 patients was observed during the sessions of the cessation program. However, there was no statistically significant difference for socio-demographic characteristics of the sample between the initial assessment (N = 76) and the final assessment (N = 55).

Regarding the motivation to quit smoking, at the initial assessment, 65.5% (n = 36) said they were prepared for action (motivated to quit smoking in the next four weeks).

The sociodemographic characteristics of the 55 individuals who responded to the final assessment are listed in Table 1. There was a predominance of females (72.4%) and level of education related to primary education (52.7%). The mean age was 52.4 years (standard deviation of 11.03), ranging from 22 to 69 years. Regarding the profile of tobacco use in the population studied, the mean age at which participants started smoking was 15.3 years (standard deviation 3.9).

Table 1. Sociodemographic characteristics of the sample that completed the smoking cessation program (N = 55)

Variables	n'	%
Sex		
Male	15	27.3
Female	40	72.7
Education level		
Elementary (complete or incomplete)	29	52.7
High School (complete or incomplete)	16	29.1
Higher education (complete or incomplete)	10	18.2
Professional occupation		
Yes	50	90.9
No	5	9.1
Age		
18 – 39 years	9	16.4
40 – 59 years	31	56.4
≥ 60 years	15	27.2

N: sample number; n': number of respondents per evaluated characteristic; %: percentage corresponding to the characteristic within the evaluated group.

Out of the 55 participants who completed the program sessions and responded to the final assessment questionnaire, 47 (85.5%) reported nicotine abstinence. Six months after the end of the follow-up, during telephone contact, out of the 55 patients who reached the end of the follow-up, 52.7% (n = 29) reported the maintenance of nicotine abstinence. It was observed that the high level

of nicotine dependence (value equal to or greater than 7 on the Fagerstrom Test for Nicotine Dependence scale) decreased from 47.3% to 0% after the smoking cessation program.

Table 2 showed no change in relation to self-reported diseases, use of pain medications in the last 15 days and consumption of alcohol among the 55 participants before and after the program. There was a statistically significant change in the proportion of physical activity before and after participating in the smoking cessation program.

Table 2. Comparison between the variables of self-reported diseases and lifestyle habits before and after participation in the smoking cessation program

Variables	Before (n=55)		After (n=55)		p-value
	n'	%	n'	%	
Use of pain medication (prescribed or not) in the last 15 days					
Yes	25	45.5	17	30.9	0.170
No	30	54.5	38	69.1	
Hypertension					
Yes	20	36.4	19	34.5	>1.000
No	35	63.6	36	65.5	
Diabetes					
Yes	5	90.9	5	9.1	>1.000
No	50	9.1	50	90.9	
Consumption of alcohol					
Yes	44	80.0	45	81.8	>1.000
No	11	20.0	10	18.2	
Physical activity					
Yes	17	30.9	33	60.0	<0.001*
No	38	69.1	22	40.0	-

*Significant statistical difference with alpha 0.05. n: sample number; n': number of respondents per evaluated characteristic; %: percentage corresponding to the characteristic within the evaluated group. Note: McNemar test for difference between two proportions for paired samples.

Table 3 presents the scores of overall quality of life (QOL) and the WHOQOL-bref domains before and after the smoking cessation program.

Table 3. Scores of overall quality of life (QoL) and the WHOQOL-bref domains for the sample before and after participating in the smoking cessation program.

Domains of the *WHOQOL-bref*	Mean (standard deviation) before the program	Mean (standard deviation) after the program
Overall QoL	57.73 (19.32)	62.73 (22.24)
Physical	52.92 (11.48)	50.32 (10.59)
Psychological	59.92 (11.88)	62.50 (13.61)
Social	63.33 (19.42)	66.67 (20.85)
Environment	55.85 (14.88)	59.20 (15.15)

QoL: Quality of Life

Table 4 lists the levels of anxiety, depression and nicotine addiction before and after the smoking cessation program.

Table 4. Levels of anxiety, depression and nicotine addiction for the sample before and after participating in the smoking cessation program

Variable	Mean (standard deviation) before the program	Mean (standard deviation) after the program
Level of anxiety	8.95 (4.41)	8.64 (4.99)
Level of depression	6.98 (4.09)	5.47 (4.08)
Level of nicotine addiction	5.80 (2.33)	0.47 (1.37)

Comparing the sample of 55 people before and after intervention with the smoking cessation program, there was a statistically significant increase in scores for overall quality of life ($p = 0.041$) and in the psychological ($p = 0.046$) and environmental ($p = 0.007$) domains. There was no significant change in the scores for the physical ($p = 0.058$) and social relationship ($p = 0.167$) domains. There was also a significant reduction in the level of depression ($p < 0.001$) and nicotine dependence ($p < 0.001$). There was no statistically significant change in the level of anxiety ($p = 0.245$).

DISCUSSION

The main findings of the study showed that the smoking cessation program contributed to the increase in the overall QOL score on the WHOQOL-bref scale and its psychological and environmental domains, besides the reduction of symptoms of depression according to the HADS scale. There was also a change in lifestyle with an increase in the proportion of physical activity and a reduction in the level of nicotine addiction.

The proportion of individuals who quit smoking after the program was high (85.5%) when compared to other Brazilian studies, which found smoking cessation rates after intervention between 26.0 and 52.6%.[18-20] According to a study [21] including 54 systematic reviews on counseling and pharmacotherapy for smoking cessation in an adult population, an 82% success rate in cessation was demonstrated with a combination of behavioral interventions with pharmacological support, similar to the findings of the present study. Six months after the end of the program in the present study, a proportion of smoking cessation of 52.7% was reached, higher than that found by a research conducted in a hospital in Brazil.[22]

The high proportion of smoking cessation found in the present study and the significant reduction in the level of nicotine dependence may be related to the high degree of motivation to quit smoking in the sample before the program. Research shows that smokers with low motivation are more likely to fail, since the pre-contemplation and contemplation phases favor non-permanence in CBT sessions, and corroborate the non-adherence to therapeutic planning and, consequently, make it possible for these smokers to not reach the successful outcome in stopping the use of nicotine.[13] Another factor that may have contributed to the high frequency of smoking cessation after the program is the increase in the proportion of physical activity practiced by the participants who completed the follow-up in the present study. Studies demonstrate that physical exercise reduces withdrawal symptoms, favoring smoking cessation.[23] A Brazilian study showed that the practice of aerobic exercise combined with CBT and pharmacotherapy was effective in improving the maximum functional capacity and quality of life of smokers.[24]

In the analyses of the present study, a statistically significant change was found between the beginning and the end of the follow-up with regard to the symptoms of depression. This result may have occurred due to increased self-esteem and care for the appearance of the participants. The results are compatible with Brazilian[13] and Spanish[14] studies that showed improvement in depression severity after treatment for nicotine addiction.

An improvement in the overall quality of life and in its psychological and environmental domains was found in the present study. The increase in the score in the psychological domain may be related to the decrease in the symptoms of depression in the sample. The increase in values in the environmental domain can be explained by the improvement in the participant's perception of his/her own home and in the adoption of health care. The increase in quality of life levels measured by the EuroQol scale (EQ-5D) after a cessation program was reported by a research in Greece.[12]

Our results can contribute to the qualification of health promotion actions in PHC. Knowledge of the profile of the user who seeks support for smoking cessation, with his/her characteristics of quality of life, anxiety, depression and nicotine addiction, can help in the adoption of strategies to increase the chance of therapeutic success. Actions are recommended to increase the smokers' motivation to quit smoking, to practice physical exercises during the process of stopping tobacco use and to monitor patients after the smoking cessation program to avoid relapse.

The limiting factor of the current research is the population made up of a non-probabilistic sample and with a small size. The proportion of smoking cessation may have been overestimated, as it was based on self-reported abstention and not by biochemical markers measured via blood tests or monoxymeters, and cessation was not assessed 12 months after the end of treatment. However, the present study addresses the panorama of a smoking cessation program in PHC with assessment of clinical outcomes and quality of life, addressed by few studies in the scientific literature. Investigations with representative samples of the Brazilian population on the results of the actions of smoking cessation programs in PHC are necessary, assessing the proportion of abstinence using biochemical markers and monitoring for more than 12 months levels of nicotine dependence, depression, anxiety and quality of life.

CONCLUSION

The analyses showed that participation in the smoking cessation program in the UBS evaluated in the study was found to be associated with a change in overall QoL, with changes in the psychological and environmental domains according to the WHOQOL-bref, and a reduction in the symptoms of depression according to the HADS scale. After participation in the smoking cessation program, there was also a change in lifestyle with an increase in the practice of physical activities, a reduction in the level of nicotine dependence, in addition to obtaining and maintaining nicotine abstinence.

Detection of predictive factors for relapse in the treatment of smoking is recommended, such as quality of life, anxiety and depression, promotion of surveillance of the maintenance of nicotine abstinence of users after the end of the program, raising awareness of professionals involved in the therapeutic approach to addiction as a strategy for strengthening and expanding the actions of the Tobacco Control Program in Primary Health Care.

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