


Retrospective analysis of a smoking cessation program in a municipality in eastern Minas Gerais: A cross-sectional retrospective study

Análise retrospectiva de um programa para cessação do tabagismo em município do leste mineiro: um estudo retrospectivo transversal

Análisis retrospectivo de un programa para dejar de fumar en un municipio de Leste Mineiro: un estudio transversal retrospectivo

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Abstract

Introduction: The “*Deixando de Fumar sem Mistérios*” (Stop Smoking with no Mysteries) program was developed to help participants quit smoking. **Objective:** To assess the number of participants who quit smoking after 12 months of the “*Deixando de Fumar sem Mistérios*” program, measure the current level of nicotine dependence in those who did not stop smoking, and detect the factors involved in the lack of adherence to the program. **Methods:** Interviews were conducted with 39 participants of the program in a municipality in Minas Gerais to administer the Fagerström test and a questionnaire on the operation of the program. We analyzed the data by calculating absolute (n) and relative (%) frequencies. **Results:** Among the interviewees, 23% reported stopping smoking, 51% did not miss the meetings, and 74% declared satisfaction with the program results. The level of tobacco dependence among participants who did not quit smoking was moderate (5.2±2.8 points), with a mean consumption of 22.9±17.3 cigarettes/day and 35.0±15.5 years of use. The factors that contributed most to the lack of adherence were logistical issues (56%) and personal beliefs (36%). **Conclusion:** The level of satisfaction with the program was high. Outdated records made it difficult to contact most participants, evidencing the need for logistical adjustments so that the program can contribute more effectively to smoking cessation among the participants.

Keywords: Tobacco use disorder; Cognitive behavioral therapy; Primary health care.

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Resumo

Introdução: O programa “Deixando de Fumar sem Mistérios” foi desenvolvido para ajudar os participantes a cessar o tabagismo. **Objetivo:** Avaliar o número de participantes que cessaram o tabagismo após 12 meses do programa “Deixando de Fumar sem Mistérios”; mensurar o nível atual de dependência da nicotina dos que não cessaram o hábito e detectar os fatores envolvidos na falta de adesão ao programa. **Metodologia:** Entrevista foi realizada com 39 participantes do programa “Deixando de Fumar sem Mistérios” em um município mineiro, para a aplicação do teste de Fagerström e de questionário sobre o funcionamento do programa. A análise dos dados foi realizada por meio do cálculo das frequências absolutas (n) e relativas (%). **Resultados:** Dos entrevistados, 23% relataram ter parado de fumar, 51% não faltaram às reuniões, e 74% declararam satisfação com o resultado do programa. O nível de dependência do tabaco dos participantes que não cessaram o tabagismo foi moderado (5,2±2,8 pontos), com consumo médio de 22,9±17,3 cigarros/dia e 35,0±15,5 anos de consumo. Os fatores que mais contribuíram para a falta de adesão foram questões logísticas (56%) e crenças pessoais (36%). **Conclusão:** O grau de satisfação com o programa foi elevado. A desatualização cadastral dificultou o contato com grande parte dos participantes, evidenciando a necessidade de adaptações logísticas para que o programa contribua mais efetivamente com a cessação do tabagismo dos participantes.

Palavras-chave: Tabagismo; Terapia cognitivo-comportamental; Atenção primária à saúde.

Resumen

Introducción: El programa “Dejar de Fumar sin Misterios” fue desarrollado para ayudar a los participantes a dejar de fumar. **Objetivo:** Evaluar el número de participantes que dejaron de fumar después de 12 meses de programa “Dejar de Fumar sin Misterios”; medir el nivel actual de dependencia a la nicotina de los que no dejaron de fumar y detectar los factores involucrados en la falta de adherencia al programa. **Metodología:** Se realizó una entrevista con 39 participantes del programa “Dejar de Fumar sin Misterios” en un municipio de Minas Gerais, para la aplicación de la prueba de Fagerström y un cuestionario sobre el funcionamiento del programa. El análisis de datos se realizó calculando frecuencias absolutas (n) y relativas (%). **Resultados:** De los entrevistados, el 23% informó dejar de fumar, el 51% no faltaba a las reuniones y el 74% declaró estar satisfecho con los resultados del programa. El nivel de tabaquismo de los participantes que no dejaron de fumar fue moderado (5,2±2,8 puntos), con un consumo medio de 22,9±17,3 cigarrillos/día y 35,0±15,5 años de consumo de tabaco. Los factores que más contribuyeron a la falta de adherencia fueron aspectos logísticos (56%) y creencias personales (36%). **Conclusión:** Hubo un alto grado de satisfacción con el programa. La desactualización del registro dificultó el contacto con la mayoría de los participantes, evidenciando la necesidad de adaptaciones logísticas para que el programa contribuya de manera más efectiva a la deshabituación tabáquica de los participantes.

Palabras clave: Tabaquismo; Terapia cognitivo-conductual; Atención primaria de salud.

INTRODUCTION

Nicotine dependence is a risk factor for the development of chronic non-communicable diseases, such as hypertension, diabetes, respiratory diseases, and cancer. Data from the World Health Organization (WHO) estimate that, aggravated by smoking, these diseases account for about 8 million deaths per year. The tobacco epidemic is, therefore, a threat to public health.¹ Consequently, it requires/demands the implementation of public policies for smoking prevention and control.

Nicotine dependence is related to the compulsion to use and nicotine tolerance. It can manifest as physical/chemical dependence, psychological dependence, or behavioral dependence.¹ Given this diversity of dependences generated by smoking, antismoking treatment strategies should be multimodal and include psychosocial and drug interventions. In this scenario, the Instituto Nacional de Câncer José Alencar Gomes da Silva elaborated the National Tobacco Control Program (*Programa Nacional de Controle do Tabagismo* — PCNT), a state program with actions to encourage smokers to quit smoking. To carry out these actions, the primary care units adopt the methodology proposed by the program “*Deixando de Fumar sem Mistérios*” (PDFSM — Stop Smoking with no Mysteries).²

PDFSM aims to help smokers develop skills to quit smoking and is based on cognitive-behavioral therapy and drug intervention provided by the Brazilian public health system (*Sistema Único de Saúde* — SUS) when necessary.² Cognitive-behavioral therapy seeks to motivate the user to manage the behavioral

change related to healthier habits, especially when it comes to smoking.³ A previous study³ revealed a 57.9% cessation rate among participants in a smoking cessation program, also carried out in the primary care context. In addition, it showed that the smoking cessation process was related to several factors, such as the level of dependence and the individual's motivation to stop smoking. However, few studies have evaluated program results in the long term. Another research — which also followed the proposals of PNCT, with smoking control groups in primary care units — demonstrated that the participants presented high rates of withdrawal from the groups and concluded that identifying the reasons for these withdrawal rates may help better understand the smoking cessation process.⁴

The present study aimed to evaluate the number of individuals who quit smoking after 12 months of PDFSM. Furthermore, our objective was to measure the level of physical nicotine dependence in individuals considered smokers at the time of data collection and detect the factors involved in adherence to the program conducted in a municipality in eastern Minas Gerais.

METHODS

Study design and ethical aspects

This is an observational retrospective study approved by the Human Research Ethics Committee of Universidade Federal de Juiz de Fora (Certificate of Presentation for Ethical Consideration — *Certificado de Apresentação para Apreciação Ética* – CAAE: 83175918.0.0000.5147) and authorized by the Municipal Health Department of a city in eastern Minas Gerais. This medium-sized city has a mean population of 281,046 people and a human development index of 0.727.⁵ We invited the individuals to participate in the research from July to September 2018 through visits to accredited Family Health Strategy (*Estratégias de Saúde da Família* — ESF) teams and telephone calls. All individuals who participated exclusively in PDFSM in 2017 were included but were not involved in planning, performing, or writing this research. We excluded those who did not agree to participate in the research, did not sign the Informed Consent Form (ICF), could not be found, and gave up participating in the study. We emphasize that the data were anonymized and will not be shared.

Determination of sociodemographic characteristics, self-reported health status, and overall evaluation of the program

Between July and September 2018, a semistructured questionnaire with 37 questions was administered to collect information on gender, ethnicity, marital status, schooling, presence of previous diseases — such as hypertension, diabetes *mellitus*, and hypercholesterolemia —, self-reported health status, and overall evaluation of the program. The participant evaluated the item about self-reported health status using a Likert scale, with five response options, ranging from “very good” to “very poor”. The program evaluation included questions on smoking cessation, the reasons for participating, the form of access to the program, and information on the operation of PDFSM, such as the health professional categories involved, the times of meetings, the medications offered, the level of satisfaction, the participant's frequency in program meetings, and the reasons that led them to withdraw from the program, as well as the prior availability of information regarding the objectives and main actions of the project. The participants could mark more than one answer option in questions related to the reasons for participating in the program, the

health professional categories involved, the times of meetings, and the reasons for withdrawing from the program. A single previously trained evaluator conducted all interviews.

Determination of the level of physical nicotine dependence at the end of treatment

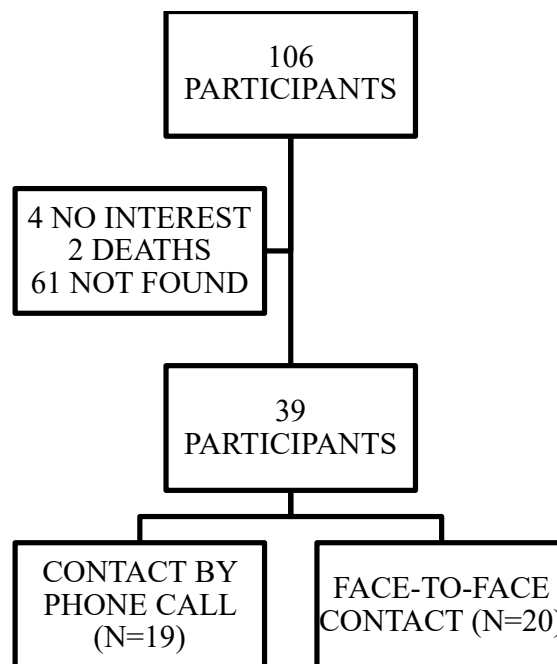
The Fagerström questionnaire was used to quantitatively determine the level of physical nicotine dependence of participants who continued smoking after treatment. This instrument scores the level of physical nicotine dependence, including the tolerance process and compulsion, on a scale of 0 to 10 points.⁶ The higher the score obtained, the higher the level of physical dependence. Values between 0 and 4 points indicate low dependence, 5 points correspond to moderate dependence, and between 6 and 10 points evidence high dependence. The Fagerström questionnaire was translated and cross-culturally adapted to the Brazilian population and is widely used thanks to its easy understanding and rapid administration.⁶

Statistical analysis

We performed the data analysis by calculating absolute (n) and relative (%) frequencies in the Jamovi software (version 1.2, Australia).

RESULTS

Among the 106 participants registered in PDFSM in 2017, 67 individuals (63.2%) did not participate in the research due to lack of interest, death, or outdated records in their respective ESF, preventing us from locating them (Figure 1).



Source: Authors, 2022

Figure 1. Flowchart of participants in the “Deixando de Fumar sem Mistérios” program in a municipality in eastern Minas Gerais in 2017.

The sample consisted of 39 participants (36.8%), and the interview was conducted by telephone and face-to-face (Figure 1).

Sociodemographic characteristics, previous diseases, and health status of the participants

Only nine participants (23.1%) quit smoking after participating in PDFSM. Most of them were women, multiracial, married, and had incomplete elementary school (Table 1).

Table 1. Sociodemographic characteristics of participants in the “*Deixando de Fumar sem Mistérios*” program in a municipality in eastern Minas Gerais in 2017.

	Quit smoking n=9	Did not quit smoking n=30	TOTAL n=39
AGE (years)*	58±15	54±12	55±13
GENDER n (%)			
Male	1 (11.1)	7 (23.3)	8 (20.5)
Female	8 (88.9)	23 (76.7)	31 (79.5)
ETHNICITY n (%)			
Black	3 (33.3)	10 (33.3)	13 (33.3)
Multiracial	4 (44.4)	17 (56.7)	21 (53.8)
White	2 (22.3)	2 (6.7)	4 (10.3)
Does not know	0	1 (3.3)	1 (2.6)
MARITAL STATUS n (%)			
Single	2 (22.2)	14 (46.8)	16 (41.0)
Married	5 (55.6)	7 (23.3)	12 (30.8)
Divorced	1 (11.1)	7 (23.3)	8 (20.5)
Widower	1 (11.1)	1 (3.3)	2 (5.1)
Does not know	0	1 (3.3)	1 (2.6)
SCHOOLING n (%)			
Illiterate	0	5 (16.7)	5 (12.8)
Incomplete elementary school	7 (77.8)	14 (46.7)	21 (53.9)
Complete elementary school	0	3 (10.0)	3 (7.7)
Incomplete high school	0	2 (6.7)	2 (5.1)
Complete high school	2 (22.2)	4 (13.2)	6 (15.4)
Higher education	0	2 (6.7)	2 (5.1)

*Data expressed as mean±SD.

SD: standard deviation.

Source: Authors, 2022.

The self-reported health status was defined as very good or good by 48.7% (n=19) of the interviewees, as regular by 35.9% (n=14), and as poor or very poor by 15.4% (n=6). Hypertension, hypercholesterolemia, and diabetes *mellitus* were reported by 33.3% (n=13), 30.8% (n=12), and 28.2% (n=11) of the participants, respectively.

Overall evaluation of the program

The reasons that most motivated participation in PDFSM were the perceived harm to health (n=17; 43.6%) and encouragement from health professionals, family members, and/or friends (n=12; 30.8%). The main form of access to the program was dissemination by community health agents (*agentes comunitários de saúde* — ACS) (n=18; 46.2%), as well as physicians (n=5; 12.8%) and other health professionals (n=13; 33.3%) (Table 2).

Table 2. General evaluation of the “*Deixando de Fumar sem Mistérios*” program in a municipality in eastern Minas Gerais in 2017.

	Did not quit smoking	Quit smoking	n (%)
REASONS FOR PARTICIPATING			
Harm to health	11 (36.7)	6 (66.7)	17 (43.6)
Encouragement of professionals, family members, and/or friends	12 (40.0)	–	12 (30.8)
Religious issues	2 (6.7)	–	2 (5.1)
Government campaigns	1 (3.3)	–	1 (2.6)
Other reasons	4 (13.3)	3 (33.3)	7 (17.9)
FORM OF ACCESS			
Dissemination by community health agents	16 (53.3)	2 (22.2)	18 (46.2)
Dissemination by physicians	3 (10.0)	2 (22.2)	5 (12.8)
Dissemination by other health professionals	9 (30.0)	4 (44.4)	13 (33.3)
Dissemination by friends	1 (3.3)	1 (11.1)	2 (5.1)
Other forms of dissemination	1 (3.3)	–	1 (2.6)
JUSTIFICATIONS FOR ABSENCE FROM THE MEETINGS			
Logistical issues			
<i>Distant location</i>	5 (16.7)	1 (11.1)	6 (15.4)
<i>Day was not convenient</i>	2 (6.7)	1 (11.1)	3 (7.7)
<i>Time was not convenient</i>	8 (26.7)	1 (11.1)	9 (23.1)
Personal beliefs			
<i>Personal reasons</i>	8 (26.7)	2 (22.2)	10 (25.6)
<i>Lack of interest</i>	–	1 (11.1)	1 (2.6)
<i>Belief that it would not help</i>	2 (6.7)	1 (11.1)	3 (7.7)
<i>Lack of motivation</i>	3 (10.0)	1 (11.1)	4 (10.3)
Lack of medication	5 (16.7)	–	5 (12.8)
Withdrawal symptoms	4 (13.3)	–	4 (10.3)
Other justifications	13 (43.3)	2 (22.2)	15 (38.5)
DRUG SUPPORT			
Bupropion hydrochloride	12 (46.2)	4 (15.4)	16 (61.5)
Transdermal patch	3 (11.5)	1 (3.8)	4 (15.4)
Both	4 (15.4)	2 (7.7)	6 (23.1)
PROGRAM SATISFACTION			
Satisfied	21 (70.0)	8 (88.9)	29 (74.4)
Indifferent	4 (13.3)	1 (11.1)	5 (12.8)
Dissatisfied	5 (16.7)	–	5 (12.8)

Source: Authors, 2022.

Most interviewees (n=34; 87.2%) stated receiving instructions on the objectives and main actions of the program before starting their participation in the 16 meetings. On average, four health professionals attended group meetings, usually dentists (n=37; 94.9%), psychologists (n=34; 87.2%), nutritionists (n=25; 64.1%), and nurses (n=23; 59.0%). Participation of professionals from physical therapy (n=19; 48.7%), medicine (n=18; 46.2%), physical education (n=16; 41.0%), and pharmacy (n=13; 33.3%) was less frequent (Table 2).

The mean frequency of participation in the groups was 5.0 ± 2.4 meetings. About half of the individuals participated in all meetings until the end of the program (n=20; 51.3%). The frequency of participation was even higher among those who stopped smoking (n=7; 77.8%).

The participants reported that the meetings took place in the afternoon, a period considered excellent or good by 69.2% of the interviewees (n=27). Additionally, the journey to the meetings was classified as very easy (n=24; 61.5%) and made on foot (n=27; 69.2%). Nevertheless, the interviewees' justifications for one or more absences (n=18; 46.2%) were related to logistical issues, such as inconvenient place (15.4%), personal reasons (25.6%), treatment issues (12.8%), and symptom issues (10.3%). Other justifications for missing the meetings were reported by 38.5% of the participants (Table 2).

Regarding the drug support offered by the program, 66.6% (n=26) of the participants declared receiving medications, with bupropion hydrochloride being the most common (n=16, 61.5%). No participant reported using chewing gum (Table 2).

When asked whether smoking cessation was related to participation in PDFSM, only four participants (44.4%) reported an association between quitting smoking and participation in the program; the other five (55.6%) indicated reasons unrelated to the program. Among the participants who did not stop smoking, 26 (86.7%) stated that they never stopped smoking, and four (13.3%) quit for a period due to their participation in the program but resumed smoking.

In the satisfaction level analysis, 92.3% of the participants declared that they liked attending the meetings, and 74.4% were satisfied with the PDFSM result (Table 2). Still, 94.9% (n=37) believe that the program truly helps people stop smoking.

Level of physical nicotine dependence

The mean Fagerström test score among participants who did not quit smoking after treatment was 5.2 ± 2.8 points, indicating a moderate level of tobacco dependence. In addition, the participants presented mean consumption of 22.9 ± 17.3 cigarettes/day and 35.0 ± 15.5 years of tobacco use.

DISCUSSION

The present study analyzed the number of individuals who quit smoking after participating in the PDFSM government program. It also measured the level of physical nicotine dependence among individuals who did not stop smoking and identified the factors involved in adherence to the program. After 12 months of the program, we were not able to contact a large number of participants. The results reveal a low smoking cessation rate and high absence rate in meetings due to logistical issues and personal beliefs. On the other hand, the level of satisfaction with the program was high among the participants. Furthermore, the individuals who still smoked at the time of data collection presented a moderate level of dependence.

Smoking generates an annual burden of R\$ 338.6 million for SUS because it strongly contributes to the development of several chronic diseases, such as hypertension, diabetes *mellitus*, respiratory diseases, and cancer, among others.⁷ Thus, smoking cessation is beneficial to the individual's health and to the health system. Quitting the use can reduce tobacco-related diseases by 30 to 90%.⁸ However, stopping smoking involves several contextual, perceptual, and personal factors for part of the population since this habit, for the time being, is associated, for example, with the appeal of tobacco advertising and the very attitude of the smoker concerning the pleasure and satiety inherent in the smoking habit, even though they know the harmful effects of this use, which generates physical and psychological dependence.^{9,10}

Although men are the main tobacco users worldwide¹¹ and in Brazil,¹² the participants in programs aimed at encouraging, motivating, and providing support for smoking cessation are mostly female.^{4,8} This statement can be grounded in the fact that women use health services more often, as they are more concerned about their own health regarding self-care compared to men.¹³ Additionally, women present lower rates of treatment discontinuation than men,¹³ and the presence of literate women in the household is a protective factor against starting smoking.¹⁴

The 2008 Special Smoking Survey (*Pesquisa Especial do Tabagismo* — PETab) showed that smoking prevalence is higher among people with lower education, ranging from 11.9% in people with 11 years or more of schooling to 25.7% in individuals with less than a year of study.¹⁵ Illiteracy is a characteristic of social inequality in Brazil. In the health area, it hinders access to health services, adding to the difficulty of following health promotion actions that require reading information.¹⁶ The PDFSM manuals, for example, were elaborated primarily with verbal language. Our results show that the proportion of illiterate individuals or people with incomplete elementary school who did not quit smoking with PDFSM was higher than among individuals with higher education levels. Thus, we underline the relevance of adopting inclusive educational material for illiterate people or those with low education who participate in government health promotion programs.

Identifying the marital status of participants in smoking cessation programs is important because this aspect influences the health status of individuals. According to Schraiber,¹⁷ marriage is considered a protective factor for male health. In addition, it is associated with a lower probability of starting smoking and a greater chance of stopping smoking.¹⁸ In the present study, a large number of participants declared being single, but the individuals who quit smoking were married. This result differs from Meier's study,¹⁹ in which married participants presented higher rates of leaving a smoking treatment program in the city of Cambé/Paraná.

For Rocha et al.,²⁰ the main reasons that lead people to continue smoking include the pursuit of pleasure, the use of cigarettes to relax, the need for concentration, the pleasure of handling a cigarette, the emotional connection with situations experienced, and the fact that cigarette facilitates social interaction. According to Miller,²¹ the factors that help smokers succeed in quitting smoking are the perceived harm to health, followed by the support of health professionals, family members, and friends. Similarly, Pereira et al.²² and Coutinho²³ identified that the plea of family members and the feeling of harm to their own health caused by smoking were determinant factors for smoking cessation. In this study, most participants declared that the reasons that motivated them to participate in the program were the perceived harm to health and the encouragement of health professionals, family members, and/or friends, even among those who were not able to quit smoking.

Individual motivation and that triggered by external agents are important for the decision to participate in smoking cessation programs and for the participant to persist in achieving their goal. The transtheoretical

model of behavior change, designed for smoking behavior change, integrates a circular instrument that classifies the subject into one of five stages, depending on their understanding and level of motivation for health-related behavior change. In stage 1 (precontemplation), the individual has no intention of changing or denies the need for change; in stage 2 (contemplation), they seriously consider the possibility of change but do not yet take action toward the process; in stage 3 (preparation), minor changes can be identified; in stage 4 (action), they are actively engaged in changing their behavior; and, finally, in stage 5 (maintenance), the continuation of change efforts is successful and becomes part of routine behavior.²⁴ The study by Pawlina et al.,¹³ which investigated the influence of motivational levels on the permanence in the program in health units of Cuiabá/Mato Grosso, revealed that most participants who discontinued treatment were in the pre-contemplation and contemplation stages. Other difficulties involved in smoking cessation are related to the large number of absences from meetings and the participants' moderate level of nicotine dependence. In addition, the follow-up duration may have influenced the success rate of the program since, after the fourth meeting, no meetings were held to embrace and encourage participants to continue not smoking. The study by França et al.¹⁴ had a 75% success rate after treatment, which, unlike the present study, lasted up to 33 months, with the maintenance of behavioral therapy for longer.

Santos²⁵ highlights the need for well-prepared professionals so they can properly approach the participants regarding the objectives and actions of the programs. However, government strategies aimed at training front-line professionals, such as the Continuing Education in Health program, have little adherence from these professionals.²⁶ Barbosa et al.²⁷ revealed a participation rate of only 57.8% of professionals from an ESF in northern Minas Gerais in the Continuing Education in Health program. Data on the training of professionals involved in PDFSM in a municipality in eastern Minas Gerais were not collected.

ACs have a leading role in disseminating information concerning the operation of the program described in this study. Therefore, these professionals clearly act as a link between the health service and the community,²⁸ as they are responsible for detecting and identifying the main needs of the population.²⁹ Furthermore, most professionals involved in the meetings were dentists, psychologists, and nutritionists. Thus, implementing programs such as PDFSM requires care, investment, and training motivation for human resources to disseminate and conduct the program.

CONCLUSION

Although the smoking cessation rate of the program was low, the participants reported satisfaction with the activities performed, a positive indication for the participation of others, and interest in participating in the activities again. The desire to participate in the program again is favorable since second participation may increase the chance of these individuals actually quitting smoking.

The limitations of this study include memory bias and the difficulty of contacting other program participants, evidencing the need for logistical adjustments so that the program can contribute more effectively to smoking cessation. This is an investigation of the application of the program in a single municipality and therefore does not allow generalization of the results. Other studies evaluating meeting conduction dynamics and the training of professionals are necessary.

CONFLICT OF INTERESTS

Nothing to declare.

AUTHORS' CONTRIBUTIONS

RQC: Writing – original draft, Writing – review & editing. ASO: Conceptualization, Data curation, Formal analysis, Writing – original draft, Writing – review & editing. RMR: Writing – original draft, Writing – review & editing. XCM: Writing – original draft, Writing – review & editing. TCGP: Writing – original draft, Writing – review & editing. LEAAA: Data curation, Formal analysis. LF: Conceptualization, Data curation, Formal analysis, Writing – review & editing.

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