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Is Tobacco Use Disorder a mental illness? A proposal for a psychological model

O Transtorno por Uso de Tabaco é uma Enfermidade Mental? Uma Proposta para um modelo psicológico

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Abstract

Analysis of the role of individual and sociocultural behavior in modifying health status is essential to explain the disease process from a psychological perspective. Tobacco use disorder is considered a chronic mental illness, but few behavioral aspects are considered in its diagnosis and treatment. Piña-López's psychological model of biological health proposes the analysis of behavioral processes to describe and explain their relative influence on the biological states of organisms that are more or less susceptible to disease. This disorder was analyzed in three stages: past, present and future. The variables taken into account to determine how the disease is generated were situations related to stress, history of competences, motives, organismic dispositional events, present competences, social dispositional events, and risk and prevention behaviors. This type of analysis makes it possible to marginalize the perspective of a chronic mental illness and to consider the contingency aspects of behavior implied in the consumption patterns.

Keywords: Behaviorism; Mental disorders; Psychological Model; Smoking; Tobacco use disorder.

Resumo

A análise do papel do comportamento individual e sociocultural na modificação do estado de saúde é essencial para explicar o processo da doença a partir de uma perspectiva psicológica. O transtorno por uso de tabaco é considerado uma doença mental crônica, mas poucos aspectos comportamentais são considerados em seu diagnóstico e tratamento. O modelo psicológico de saúde biológica de Piña-López propõe a análise dos processos comportamentais para descrever e explicar sua influência relativa nos estados biológicos dos organismos que são mais ou menos suscetíveis a doenças. Esse transtorno foi analisado em três estágios: passado, presente e futuro. As variáveis levadas em consideração para determinar como a enfermidade é gerada foram as situações relacionadas ao estresse, histórico de competências, motivos, eventos disposicionais organísmicos, competências atuais, eventos disposicionais sociais e comportamentos de risco e prevenção. Esse tipo de análise permite marginalizar a perspectiva de uma doença mental crônica e considerar os aspectos contingenciais do comportamento implicados nos padrões de consumo.

***Palavras-chave**: Comportamentalismo; Transtornos mentais; Modelos Psicológicos; Fumar; Tabagismo.*

The growth of interdisciplinary fields related to psychology and health, such as health psychology, psychological medicine, and related fields, has led to a conceptual pluralism, which is not always clearly defined, and the behavioral dimensions involved. In this context, the analysis of the participation of individual and sociocultural behavior in modifying states of health is essential for explaining the process of illness from a psychological perspective (Ribes, 2018). For this reason, the homeostatic alterations that define the manifestation of illness cannot be disassociated from the sociocultural and ecological aspects that cause it.

The behavioral dimension as an individual practice is indispensable for analyzing the particular conditions that distinguish one person, as a biological entity, from others, even in a similar ecological context. Indeed, certain factors such as socioeconomic status, developmental conditions or infrastructure of a society, cultural practices and educational level comprise essential aspects for the development of pathologies. However, the influence of these sociocultural components can only be decisive when considering the specific relationship of each individual with their environment (Ribes, 1990).

Although it cannot be assumed that every homeostatic alteration in the body involved in the onset of a disease is the result of an individual's social and behavioral practice in an ecological environment, it is possible to attribute implications of individual behavior in the etiology, prevention, treatment or rehabilitation of a disease. In this respect, according to Ribes (1990), the psychological or behavioral dimension of health implies three fundamental parameters: the way in which behavior participates in the modulation of biological states; the competences that define the individual's effectiveness in interacting with situations that determine the state of health; and the consistent manner of behavior typical of an individual, which may affect health.

These three parameters develop a variety of distinct psychological functions that directly influence the process of health or illness. The behavior resulting from "knowing how to do things", "not knowing how to do things", "doing things in a certain way" or "doing things under certain conditions" comprise the fundamental psychological elements involved in the study of health. These aspects are central to the processes of etiology and treatment for the so-called mental disorders.

For example, the Diagnostic and Statistical Manual of Mental Disorders, (DSM-5) American Psychiatric Association (2013) considers nicotine addiction to be a chronic mental problem and defines it as Tobacco Use Disorder. It proposes that this disorder is a problematic pattern of tobacco consumption that leads to clinically significant impairment or distress, manifested by at least two of 11 diagnostic criteria, occurring over a 12-month period. These criteria include factors related to the speed and magnitude of the increase in consumption, difficulty in abstinence, craving, tolerance, withdrawal syndrome and personal, social, interpersonal and health-related problems generated by tobacco use.

Based on this definition, this disorder can be diagnosed by factors unrelated to psychology or by subjective factors which are non-specific to tobacco consumption, such as craving, tolerance and withdrawal syndrome. Although these factors provide important information about smoking, and there is evidence of neural physiological alterations associated with heavy consumption, the diagnosis of this type of disorder relies on the magnitude of tobacco consumption (for example, the Fagerström test for nicotine dependence) and non-specific physiological, emotional and behavioral symptoms, even when it assumes the absence of biological aspects (Lopes et al., 2023). The incoherence between mental and physical characteristics is what possibly makes Tobacco Use Disorder a multivocal construct with broad classification criteria (Barbosa et al., 2014).

Another important aspect that should be considered regarding the dualism in the logical approach to smoking is the form of treatment. According to Silveira et al. (2021), the treatment for smoking disorders is guided by the data collected on smoking history, cognitive-behavioral therapy, usually group therapy, and medication. In theory, this type of approach considers the behavioral parameters related to addiction; however, the process of understanding this disorder follows a different line of reasoning from the therapeutic approach, and this could explain the discrepancies found in the literature regarding the best treatment method, whether medication, psychological therapy or a combination of both (U.S. Department of Health and Human Services, 2020).

According to Reyna et al. (2019), this dualistic logic of the effect that the mind may have on the body and behavior, and vice versa, is what has strengthened research in the area of mental health and the supposed phenomena that make the mind become ill, leading to the necessity for critical reflection on the dimensions involved in these types of disorders and the assumptions that underlie them. In other words, this epistemological incongruity in the understanding of illness suggests causes of a different (mental) nature to the type of analysis adopted for etiology, diagnosis and treatment (medical and behavioral).

In this sense, it is important that the evaluation of the individual's interaction with the environment can provide the essential aspects of the psychological dimension related to the illness, and thus, it is possible to lay the foundations for the contingency analysis involved in the onset and treatment of Tobacco Use Disorder. The aim of this article is to provide an interbehavioral approach to the development of Tobacco Use Disorder.

Interbehaviorism

According to Ribes and López (1985), the meta-system formulated by Kantor and Smith (2016) in relation to the inseparable interaction between the activity of an individual's behavior in response to another or the functional properties of a stimulating object brings two important changes to historical behaviorism. At first, it highlights the definition of behavior as inter-conduct or psychological behavior, as the interaction between an individual and the environment. Secondly, it formulates a descriptive and explanatory system that diverges from the classical causal scheme, in which the conception of the behavioral field is of a synchronic nature.

By analyzing this interaction, interbehaviorism allows the distinction of psychological phenomena from biological and social ones. In contrast to biology, which tries to study the different organic responses (more or less standardized by species), developed in certain situations, psychology treats the individual as a primary actor and seeks to identify the reactive/active patterns executed in relation to the stimulating objects in the behavioral segment of interest, considering the differential way of responding that is learned over the course of different previous functional contacts (Kantor & Smith, 2016).

Kantor and Smith (2016) propose the concept of the interbehavioral field to facilitate the analysis of the psychological reactive systems that occur during the contact between the behaving individual and the environment. This is an (abstract) conceptual representation of a segment of the individual's interaction with their environment, in which the following factors are highlighted: the functional contact between the individual and another individual or object, the means of contact, the boundaries of the field and the dispositional factors (Ribes, 2018).

Ribes (2018) assumes that functional contacts are the mutual and bidirectional relationships between a behaving individual and a stimulating object or another individual with whom they

interact. The contact is not a single or isolated episode, but comprises a recurring trend of a process of changes in the segmentation of the individual's interaction with the stimulating environment, based on the interbehavioral history and biological potentialities of the individual.

Dispositional factors comprise all the elements of the interbehavioral field of interaction that are not directly configured in the functional contact, but which affect the likelihood of certain responses occurring (Ribes, 2018). Thus, any description of the field must include the way in which dispositional factors and their continuous changes influence the relationships of interaction that are established between an individual and the environment, as interdependent contingencies.

For example, they are essential for understanding behavior related to tobacco dependence, as they constitute elements that make cigarette consumption likely (stimuli associated with drug use and craving, emotions or feelings, environments, etc.).

According to Ribes (2018), there are two types of dispositional factors: historical and situational. Historical dispositional factors are manifested in the individual's reactive biography with the environment. They represent a set of events that update the current interaction; in other words, they correspond to the way of functional contact that the individual has historically generated in similar situations. For example, a smoker who has historically consumed cigarettes after drinking coffee will have a predisposition to smoke after consuming coffee. In this case, the habit created by drinking coffee is a dispositional factor that makes nicotine administration more likely.

By contrast, situational dispositional factors can be identified with states of the environment and/or the individual that quantitatively modulate the characteristics of functional contact. The state of the environment can vary in terms of texture, quantity, constancy and fluctuations of objects and events (Ribes, 2018). Likewise, the state of the organism (for example, sick or healthy, under the effect of drugs and hungry or thirsty) will facilitate or hamper a specific type of psychological interaction with the environment.

Another essential component evaluated in an individual's interaction with the environment is what Ribes and López (1985) call stimulating objects or events. These comprise the bodies and physicochemical events with which the organism has direct or indirect contact. Of course, the individual does not make functional contact with all the objects present in a behavioral segment, but only with those objects that are dispositionally relevant, i.e. those that are functional in the present circumstances.

The way in which the individual interacts with stimulating objects in their environment is given not only by biological reactive systems, but by the particular behavioral repertoire of variable complexity that constitutes their reactive/active patterns. Ribes (2018) proposes that psychological reactive/active patterns can be of three types, based on the changes they produce: effective, ineffective, and affective.

The same author considers that effective reactive patterns are those that produce changes, alterations or modifications in the environment or that allow movement or locomotion to meet achievement criteria. Ineffective reactive patterns do not alter the individual's body location or affect others, but only allow for the location and recognition of stimulating objects and events. Affective reactive patterns, like ineffective ones, do not promote changes in the environment and do not meet achievement criteria, but comprise reflex movements or corporal reactions that make up what is socially known as affectivity.

Now that we have understood the aspects that make up the interbehavioral field as a relationship of contingencies which enable an individual to interact with the relevant stimulating

objects, let's analyze the way in which this theoretical basis allows us to identify the psychological and behavioral aspects related to the development of Tobacco Use Disorder.

The Psychological Model of Biological Health

From an interbehavioral point of view, it can be complex to understand smoking as a biological disease, since this concept is mostly applied in the presence of a causative biological agent or morphological alterations due to trauma (Ribes, 1990). The need to create a psychological model of biological health arises from the scarcity of means that are epistemologically congruent with psychology to explain the emergence of behavioral disorders. It is therefore difficult to analyze the psychological factors involved in a disease, based on standardized questionnaires and symptom evaluations, in the absence of a contingency analysis.

Ribes (1990) proposed a psychological model of health, based on the theory of conduct, which establishes the processes of health and illness as the result of a person's particular form of behavior that adjusts or fails to adjust to the changes taking place in their environment.

The model aims to explain the analysis of psychological processes in order to balance their relative influence on the biological states of organisms that are more or less prone to disease. It includes two types of descriptive categories: one that refers to psychological processes, which link conditions of the organism as actions of the individual marked in a sociocultural environment, and one that implies the results of these processes (Ribes, 1990).

Piña-López (2008) suggests some variations to Ribes' (1990) psychological model of health, with the aim of including some dispositional variables that can play a fundamental role in the development of illness.

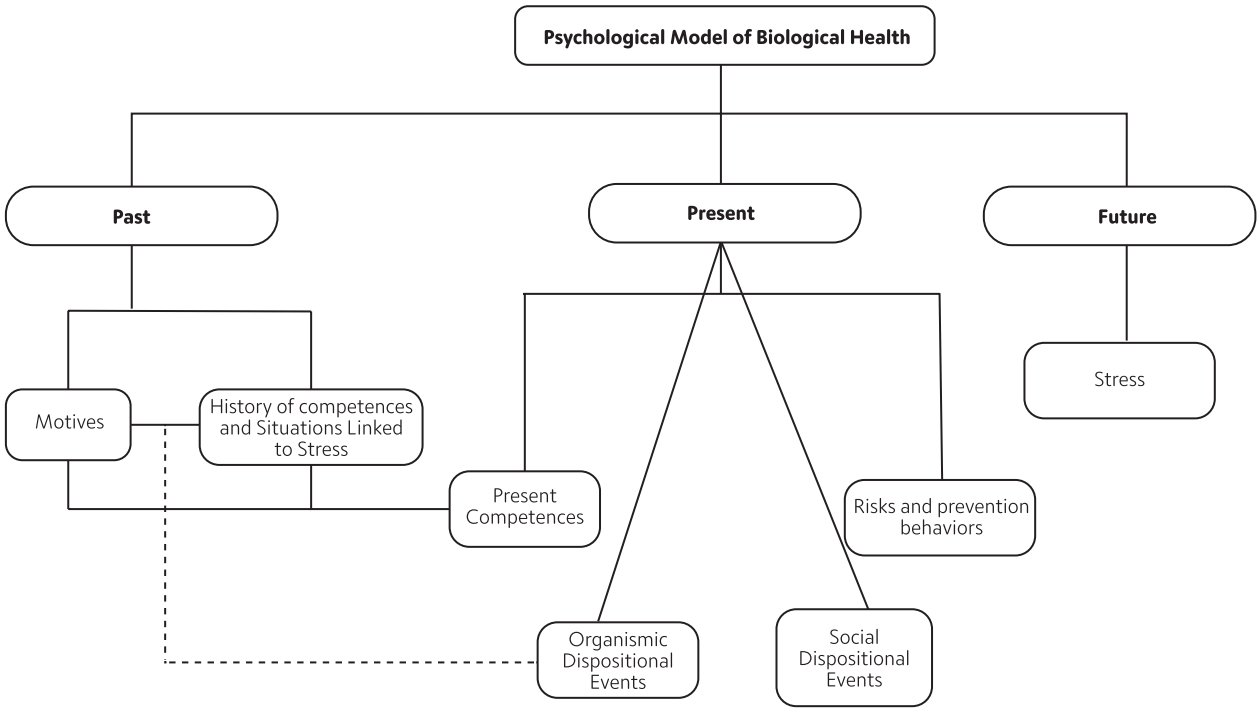
The first of these proposals relates to motivation for risk behaviors and disease prevention. This is a key factor in assessing present competences, especially with regard to instrumental risk and prevention behaviors. In addition, in the case of diagnosed diseases, motives are fundamental to the processes of adherence to treatment and rehabilitation.

The second proposal is the reactive disposition, which is specific to an individual and whose dynamic interaction with the environment generates structural and functional consequences for the various biological subsystems (for example, the immune, cardiovascular, nervous, and endocrine systems).

Another important aspect is the need to use more psychological terms, of a dispositional nature, to refer to the organization or disorganization of each person's reactive states: homeostasis and stress (Piña-López, 2008). These terms are proposed to replace biological health and illness, based on a proposal to analyze the interaction between the individual and the environment. In this way, emphasis is placed on how the person behaves, and the articulation of biological structures and functionalities is analyzed to explain the disposition to stress.

Piña-López (2008) proposes that the process of homeostasis and stress be analyzed in three stages: past, present and future (Figure 1). In the past, three variables are proposed: the situations linked to stress, the history of (past) competences and motives. In the present, four categories of analysis are established: organismic dispositional events, present competences, social dispositional events and risk and prevention behaviors. Finally, in the future, the way in which all these factors come together to generate or prevent stress is evaluated.

Figure 1
Psychological model of health



Source: Proposed by Piña-López (2008, p. 22).

The time analysis of the past, present and future applied to Tobacco Use Disorder can make it easier to distinguish, respectively, three fundamental stages of smoking: experimental use, regular or abusive use, and the disorder or addiction. In the past, the factors related to the individual's first contacts with tobacco are analyzed; in the present, the way in which the interactive history leads to regular consumption is identified; and finally, in the future, the way in which the various factors are articulated in the development of addiction is evaluated.

Once we have understood the fundamental characteristics of the psychological model, let's now analyze each aspect of the psychological model of biological health related to the development of Tobacco Use Disorder.

Psychological Model of Tobacco Use Disorder

We will start by evaluating each category of analysis situated in the past. Situations linked to stress are related to what Ribes (2009) calls interactive styles and are conceived as situations a person faces in which stimuli acquire defining functional properties or act on the consequences of the response. In other words, interactive styles comprise aspects similar to what is known as personality. However, the main difference between these concepts is that interactive styles comprise the result of an individual's way of behaving in the face of the contingencies that configure functional contact and the individual's history of interaction in similar situations (Ribes, 2018).

Of all the interactive situations proposed by Ribes (2009), six are relevant to the emergence, maintenance, and chronification of stress: decision-making, tolerance of ambiguity, tolerance of frustration, risk tendency, conflict, and impulsiveness (Campuzano & López, 2002).

The literature suggests the influence of impulsivity traits on experimentation, maintenance, and addiction (Mathew et al., 2015; Pang et al., 2014; Roys et al., 2016). In addition, impulsivity is present at higher levels in chronic smokers compared to non-smokers, and has been related to the severity of nicotine dependence, higher levels of craving after a period of abstinence, smoking to relieve negative emotions, and faster relapse after an attempt to abstain from tobacco (Balevich et al., 2013; Potvin et al., 2015; Roys et al., 2016).

In this way, the impulsivity contingencies of a situation comprise a fundamental factor related to situations linked to stress, evaluated in the past moment, since these are situations or contingencies that induce the individual to a pattern of responses that are incongruent with the consequences that operate on tobacco use (Ribes, 1990); for example, which influences experimentation and the abuse of tobacco.

The second factor of analysis related to the stress process, which is found in the past, is the history of competences. This refers to the capacity acquired by the individual to interact effectively in situations that require certain results (Piña-López, 2008). In the context of the model, it is assumed that having skills and having practiced them in the past is a way of preventing or not developing a disease.

The history of competence applied to smoking involves an individual's ability to adopt approach or avoidance behaviors in relation to tobacco consumption. For example, an individual who is aware of the consequences related to tobacco consumption and has a good repertoire of adaptive skills, such as assertiveness, self-confidence, and self-esteem, is expected to develop a lower predisposition to experimental tobacco use.

The category of motives denotes a dispositional concept related to the choice or preference for objects, events, or other people in a situation where there are socially valued consequences (Piña-López, 2008). Therefore, "wanting to do something" represents an opportune and relevant behavior in an interactive situation.

Based on the above, the etiological models of smoking that assume the necessity of acceptance by a reference group or those that suggest an impact of beliefs about the use and consequences related to tobacco consumption provide some elements that help to understand the motives for experimental and habitual use (Ajzen, 1985; Bandura, 1986; Krohn et al., 1982). For example, one of the reasons why adolescents use cigarettes may be related to the idea that nicotine helps to cope with stressful situations or that smoking provides better social recognition.

Now that we have mentioned the categories that are analyzed in the past, we can present the categories that make up the present events; in other words, the situations that bring individuals' dispositions towards regular tobacco consumption into the present.

Organismic dispositional events refer both to the structure and generic reactive functionality of organisms and to the specific reactive state of each individual to the interactive environment, making it possible to evaluate the initial or terminal conditions of change (Piña-López, 2008). Organismic dispositional events related to Tobacco Use Disorder include emotions and genetic, neural, and pharmacological components, which facilitate or hamper the consolidation of Tobacco Use Disorder (Heilig et al., 2021).

Dispositional social events comprise the elements of the contingency field that make a behavior likely to be appropriate and relevant from the perspective of a reference group. For example, it is assumed that socializing with a group of friends who smoke is more conducive to smoking than the situation in which a teenager smokes at home, where the behavior is frowned upon by their parents.

Another relevant category to be analyzed is present functional competences. These involve aspects of the demands of the situation as a field of contingencies, the factors that define the context of interaction and the relevant history of competence. This entails knowing "what" and "how" to respond to the situation (Piña-López, 2008). In addition, present competences are strongly based on the reasons for doing something and the consequences of past behaviors carried out in situations that required certain results. These past consequences are interwoven with the situations of current competences to make the behavior more likely.

Based on the above, present functional competences related to tobacco consumption correspond, for example, to situations in which a smoker, who is seeking abstinence, develops strategies to avoid or resist repeated consumption or in the face of each craving episode. Hence, we can assume that this individual's behavior is based on the consequences obtained in similar past situations and the current reasons for doing or not doing so. Although smoking or abstaining from tobacco does not, in itself, constitute a present competence, these behaviors directly imply the outcome of the prevention or development of Tobacco Use Disorder.

By establishing craving as a central component in smoking, this construct articulates the influence of past competences, motives, and interbehavioral history on the development of stress. Stewart et al. (1984) define it on the basis of classical conditioning and interpret it as a specific psychological behavior involving a particular motivation to consume tobacco and a state of intense activation of the autonomic nervous system, which prepares the organism to receive the drug and anticipates the effects of nicotine. The authors also assume that this motivation to acquire and consume tobacco occurs especially when individuals are exposed to dispositionally relevant stimulus objects that have previously been associated with tobacco consumption.

The last components of analysis of the present stage are risk and prevention behaviors. These include instrumental risk or prevention behaviors, which consist of actions by individuals that directly or indirectly decrease or increase the likelihood of stress; such as the organization or disorganization of reactive states (Piña-López, 2008).

In the case of Tobacco Use Disorder, instrumental preventive behaviors are basically all those that prevent the smoker from coming into contact with tobacco, such as not buying cigarettes or spending less time in environments where tobacco is normally consumed, among others. In contrast, instrumental risk behaviors are all those that encourage or increase the individual's contact with tobacco; for example, having cigarettes available or frequenting environments where the drug is used.

Finally, stress is related to what the American Psychiatric Association (2013) recognizes as Tobacco Use Disorder. However, although the DSM-5 provides information for the identification of organismic dispositional events (symptoms or clinical criteria) present at a given level of assessment, it is not entirely congruent with the type of behavioral analysis of a psychological model of health. It is therefore essential to delimit the factors between the logic of physiology and the study of psychology so that there is epistemological harmony regarding the health problem in question.

First of all, it is important to recognize that there are different levels of tobacco use. The American Psychiatric Association (2013), through the DSM-5, groups abuse and dependence under the category of Tobacco Use Disorder, which can be classified as mild, moderate, and severe, according to the number of symptoms presented by individuals. As mentioned above, since symptoms are the criteria for diagnosing this disorder; and since these are mostly behavioral, we can assume that Tobacco Use Disorder should be considered a behavioral problem.

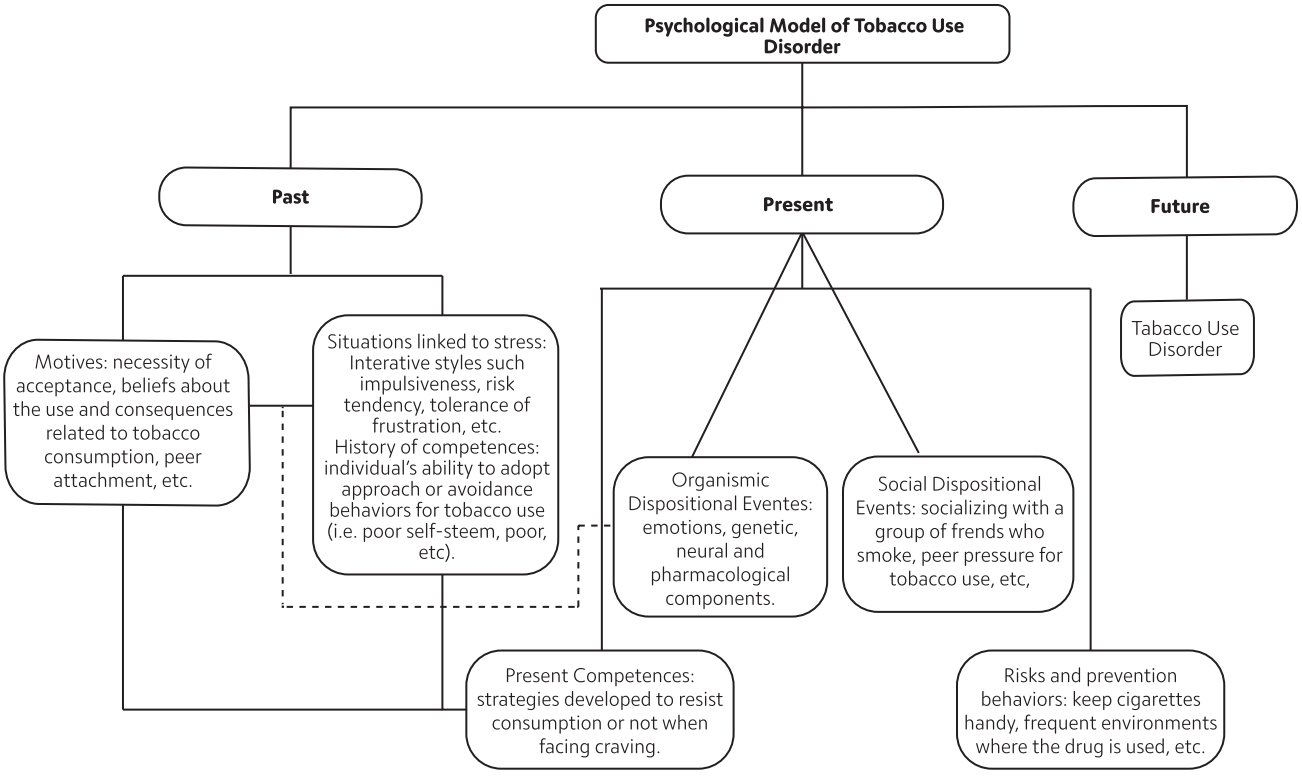
In this sense, addiction to tobacco or any other drug is the result of natural processes that involve voluntary (operant) behavior – specifically the choice to consume a chemical substance

(Heyman, 2009). Baum (2010) assumes that all behavior is a choice and considers that choice is the allocation of behavior among activities that take place on multiple time scales. This means that choice in a given context consists of allocating more time to two or more activities.

For example, smokers choose to consume tobacco on time scales proportional to the value placed on the drug; in this way, individuals manifest a loss of self-control and make decisions based on the values of the consequences of smoking, which in turn can alter the values of the outcomes of smoking (Rachlin, 2000).

From this perspective, an alternative way of analyzing Tobacco Use Disorder from a psychological perspective is to consider it as a maladaptive choice (that generates disharmony in a given social context), which is permeated by motives for use, interactive styles, competences, biological factors, and dispositional events that predispose people to develop the disorder (de Almeida Cunha & Martínez-Munguia, 2021; Malloy-Diniz et al., 2019; Swerdlow et al., 2020). This type of analysis makes it possible, on the one hand, to marginalize the perspective of a chronic mental illness, and on the other, to contemplate the contingency-based aspects of behavior and identify the psychological factors involved in consumption patterns. The Psychological Model for Tobacco Use Disorder is presented in Figure 2.

Figure 2
Psychological model for Tobacco Use Disorder



Final Considerations

The current perspective of associating Tobacco Use Disorder with the biological manifestations that permeate it still faces difficulties in framing it as a chronic mental illness. This

is because this health problem is interpreted from one analysis logic (mental health) and diagnosed and treated from another (behavioral and pharmacological).

The problem with considering addiction as a mental disorder is that it becomes a chronic and subjective disorder in terms of symptoms and diagnosis. On the one hand, it is subjective because craving, withdrawal, and tolerance do not necessarily correlate with the reduction of nicotine in the body; furthermore, it is difficult to quantify them. On the other hand, to assume that it is a chronic condition such as diabetes or cardiovascular disease is to consider it a problem that has no cure – a notion completely opposite to what is observed with tobacco abstinence.

A more rational way to understand Tobacco Use Disorder is to consider it as a choice-based behavior; in which, under certain circumstances, drugs have an advantage over other options due to the sensations of immediate pleasure. These sensations are not particularly subject to satiety, a factor that can diminish the value of other options and whose negative effects are slow to appear. This seems to be true especially in the early stages of consumption, when one can still choose whether or not to use the drug, before the characteristic neuronal changes associated with drug abuse.

However, we cannot assume that all the synaptic changes that occur in the brain as a result of drug use are characteristics that allow us to unequivocally conclude that they are related to a psychological mental illness. It is important to understand that any persistent change in behavior will be associated with alterations in the central nervous system, because the latter participates in behavior and vice versa.

From a psychological point of view, the strategy of an effective biological health system implies providing the individual with the practical resources necessary to reduce the environmental factors that increase biological vulnerability, while at the same time extending instrumental forms of action to prevent any risk linked to the onset of chronic or acute biological pathologies.

Therefore, the Psychological Health Model is an epistemologically congruent resource with the understanding of smoking as a maladaptive or dysfunctional behavior and can be used to provide essential tools for the diagnosis and treatment of patients with Tobacco Use Disorder.

This proposal makes sense when evaluating the use of the contingency control method to treat smoking, for example. Contingency control has been shown to be an effective treatment for smoking, because it provides immediate reinforcers contingent upon a decrease in tobacco consumption. This approach allows subjects to be aware of the associations of stimuli with use and experience short-term benefits compared to the long-term benefits of abstaining from smoking.

This method is functional because it carries out a contingency analysis of the development of the smoking habit and associates situations in the interbehavioral field with the repetition of the behavior. In this same sense, contingency assessment should comprise one of the main resources for establishing the diagnosis, levels of consumption, and even an unambiguous definition of the disorder.

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