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COGNITIVE DISSONANCE AND RISK PERCEPTION IN MEXICAN FEMALE SMOKERS: A CROSS-SECTIONAL ANALYSIS

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ABSTRACT

Cognitive dissonance may play a significant role in how individuals rationalize harmful behaviors such as smoking, particularly among women who face unique sociocultural and emotional barriers to cessation. This study aimed to examine the relationship between cognitive dissonance and risk perception in Mexican adult female smokers, while identifying psychological profiles and key predictors that influence awareness of smoking-related risks. A cross-sectional, quantitative approach was applied to a purposive sample of 203 women between the ages of 14 and 56 who self-identified as active smokers. Data were collected using a validated Risk Perception Scale and a Cognitive Dissonance in Smoking Scale developed for this research. Descriptive statistics, Pearson's correlation, ANOVA, multiple linear regression, and k-means cluster analysis were conducted using SPSS version 25. Findings indicated that higher levels of cognitive dissonance were significantly associated with lower levels of risk perception ($r = -.43$, $p < .001$). Additionally, educational attainment and age at smoking initiation emerged as relevant predictors of risk perception. The cluster analysis revealed three distinct cognitive-perceptual profiles: minimizers, ambivalent smokers, and coherent-aware smokers. These results suggest that cognitive dissonance operates as a regulatory mechanism that diminishes perceived risk, thereby reinforcing addictive patterns. The findings underscore the importance of incorporating gender-sensitive and emotionally informed strategies in public health interventions aimed at reducing tobacco use among women.

KEYWORDS: Cognitive dissonance, risk perception, smoking, women, behavioral health

1. INTRODUCTION

Tobacco consumption continues to be one of the main global public health challenges. According to the World Health Organization (WHO), smoking is responsible for more than eight million deaths each year, of which more than seven million are a consequence of direct consumption, and about 1.3 million, of second-hand smoke affecting non-smokers. In Mexico, the National Survey on Drug, Alcohol and Tobacco Consumption (ENCODAT, 2016-2017) reported that 20.1 million people are

active smokers, which represents a substantial burden on the health system. Although men have historically presented a higher smoking prevalence (31.3%), the number of female smokers has shown an upward trend, with a prevalence of 9.8% (equivalent to 3.6 million women), which warrants a specific and contextualized analysis.

Although female smoking has historically received less attention than male smoking, multiple studies have shown that women face particular barriers to quitting smoking and show poorer outcomes in long-term cessation treatment. This difference is attributed to psychosocial and emotional factors, especially the presence of mood disorders such as anxiety and depression. Evidence suggests that many women turn to tobacco as an emotional self-regulation strategy, using it to mitigate psychological distress associated with stressful events or experiences of vulnerability, in what has been called the self-medication model (Delcroix et al., 2024; Cano-Bedoya et al., 2022).

This consumption pattern is exacerbated in social contexts in which women face structural pressures stemming from gender inequality, symbolic violence, and the emotional burden of traditional roles. Various qualitative studies have documented that many women initiate or maintain substance use as a response to adverse experiences, such as abandonment, intimate partner violence or social exclusion, especially among vulnerable populations such as sex workers, women in prison, migrants and indigenous women. Added to this are significant barriers to access to treatment, such as the lack of programs with a gender focus, moralizing stigma and the absence of support networks for the care of children (Fernández Milán, 2021).

In this complex context, it is essential to analyze the psychological mechanisms that influence the persistence of tobacco use, even in women who are aware of the risks involved. One of these mechanisms is cognitive dissonance, a concept proposed by Festinger (1957), which refers to the discomfort generated by the inconsistency between beliefs and behaviors. In the case of women smokers, dissonance can manifest itself when they recognize the harms of smoking but continue to smoke, which generates psychological tension that is usually resolved by rationalizations or risk minimization. This phenomenon is closely related to risk perception, i.e., the person's assessment of the probability and severity of the harm he or she may suffer as a result of his or her behavior. Risk perception, far from being a purely rational process, is mediated by affective, cultural and gender factors.

Despite widespread knowledge about the harmful effects of smoking, many women continue to smoke due to a combination of emotional, cognitive, and social factors. The interaction between cognitive dissonance and risk perception could be key to understanding why some women, even when informed about the dangers of smoking, fail to quit. This relationship is even more relevant if we consider that low risk perception has been identified as a predictor of continued consumption, while high dissonance can lead to avoidance or denial of health information.

In the face of this problem, comprehensive therapeutic approaches have been explored that consider both the emotional dimension and the behavioral aspects of consumption. One of the most promising treatments for women with depressive and anxious symptoms is Behavioral Activation (BA). This approach, derived from cognitive-behavioral therapy, focuses on increasing the person's participation in meaningful activities, reducing emotional avoidance, and promoting a life aligned with personal values. Recent studies have shown that Behavioral Activation can significantly improve abstinence rates in female smokers, while reducing depressive symptoms, increasing well-being and strengthening commitment to behavioral change (Magdaleno Rico, Cruz Morales and Lira Mandujano, 2023).

Considering this background, the present study aimed to analyze the relationship between cognitive dissonance and risk perception in a sample of older Mexican women smokers, through the application of a structured survey that included specific psychometric scales to assess both variables. The subjective motives for smoking and the role played by negative emotions as triggers or maintainers of the habit were also investigated. The objective is to generate empirical evidence that allows a deeper understanding of the phenomenon of smoking among women and to contribute to the design of interventions with a gender perspective that respond to their emotional and social needs. By integrating the analysis of cognitive variables with emerging therapeutic strategies such as Behavioral Activation, this research seeks to broaden the horizon of understanding and approaching female smoking in Latin American contexts.

METHODOLOGY

Research Design

The research adopted a quantitative approach, with a non-experimental, cross-sectional design and a descriptive-correlational scope.

Participants

The sample consisted of 203 Mexican women of legal age, selected by non-probabilistic convenience sampling. The inclusion criteria were: a) being 18 years of age or older, b) residing in Mexican territory, c) self-defining as an active smoker, and d) accepting to participate voluntarily in the study. Women who were currently undergoing intensive psychological or psychiatric treatment for addictions or mood disorders were excluded to avoid biases related to external interventions.

Research instruments

1. Cognitive Dissonance Test on Smoking

This instrument was developed specifically for the present study, with the aim of measuring the level of cognitive dissonance experienced by women when smoking, knowing the risks involved. It consisted of 15 Likert-type items, with response options from 1 (do not agree at all) to 5 (strongly agree). Some representative items were: "I know that smoking is harmful, but I cannot quit" and "Smoking causes me guilt, but I keep on doing it".

The test showed high internal consistency in the present sample ($\alpha = .87$), and the items were reviewed by experts to ensure their content validity

2. Test of Perception of Risk Associated with Smoking.

This questionnaire consisted of 17 Likert-type items (scale from 1 to 5), focused on evaluating the subjective perception of risk that women attribute to the act of smoking. It addressed physical, psychological and social dimensions of risk, including items such as “Smoking can affect my fertility”, “Smoking harms those who live with me” or “I feel vulnerable to diseases due to smoking”.

The instrument obtained excellent internal reliability ($\alpha = .91$) and showed adequate item discrimination. Higher scores indicate greater awareness of the risks associated with smoking.

3. Sociodemographic questionnaire.

Designed to collect basic information on age, marital status, educational level, employment status, number of cigarettes consumed daily, age of onset of consumption and family history of smoking. This information made it possible to characterize the sample and explore possible associations with psychological variables.

Procedure

For data collection, a Google forms online questionnaire was used, which was distributed through institutional platforms between 14/04/2025 and 13/06/2025. Prior to accessing the questionnaire, informed consents were given, clarifying that participation was voluntary and anonymous, and the objective of the research was explained. The average time for filling out the questionnaire varied between 25 and 30 minutes. Participants were not compensated for their participation. The research complied with the ethical criteria for human research, according to the ethical standards of the American Psychological Association manual (APA, 2010) and the Helsinki declaration (World Medical Association, 1964) and was approved by the Bioethics Committee of the Universidad del Valle de México.

Data analysis

Descriptive statistical analyses (mean, standard deviation, frequencies and percentages) were performed to characterize the sociodemographic sample and to obtain general measures of the psychological variables: cognitive dissonance and perception of risk associated with smoking.

To determine the internal consistency of the instruments, Cronbach's alpha coefficient was calculated, with values above .70 being considered acceptable. Correlations between quantitative variables were analyzed using Pearson's r coefficient, once the assumptions of normality had been verified by means of Kolmogorov-Smirnov tests and histogram exploration.

Analyses of variance (one-factor ANOVA) were applied to compare levels of risk perception according to educational level. In addition, multiple linear regression was used to identify significant

predictors of risk perception, incorporating cognitive dissonance, age, age at onset of consumption and educational level as independent variables.

Finally, a k-means cluster analysis was performed to identify cognitive and perceptual profiles among the participants according to their scores on the scales used. Statistical significance was established at a 95% confidence level ($p < .05$).

RESULTS

Characterization of the sample

The mean age of the participants was 27.97 years ($SD = 7.1$), with a range between 14 and 56 years. The mean age of smoking initiation was 16.4 years ($SD = 2.9$).

Table 1. Sociodemographic characteristics.

Variable	M (DE) / %	Range
Age	27.97 (7.1)	14–56 years
Age at first use	16.4 (2.9)	11–24 years
Marital status	Single	55%
	Married/free unión	36%
	Separated/divorced	9%
Educational level	University	72%
	High school	24%
	Basic	4%

In terms of marital status, 55% reported themselves as single, 36% as married or in union, and 9% as separated or divorced. Seventy-two percent had a university education, 24% had a high school education and 4% had a basic education.

Reliability analysis

The instruments used showed adequate levels of internal consistency.

Table 2. Reliability

Test	ítems	Cronbach's α
Test of Cognitive Dissonance in Smoking	15 ítems	0.87
Test of Perception of Risk Associated with Smoking	17 ítems	0.91

Correlations between variables

A negative and significant correlation was observed between cognitive dissonance and risk perception ($r = -0.43$, $p < .001$), indicating that the greater the cognitive dissonance, the lower the risk perception of smoking. Relevant associations were also found with sociodemographic variables.

Table 3. Correlations

Variables	r	p
Dissonance - Risk perception	-0.43	< .001
Age - Cognitive dissonance	-0.28	.003
Age of onset - Perception of risk	0.22	.014

Differences according to educational level

An analysis of variance (ANOVA) was performed to compare risk perception according to educational level. Statistically significant differences were found ($F(2, 200) = 6.91$, $p = .002$). Participants with university education reported higher levels of risk perception compared to those with elementary or high school education.

Table 4. Perception of risk according to educational level

Educational level M (SD) risk perception Comparisons		
Basic	3.12 (0.61)	a < c
Upper intermediate	3.42 (0.52)	b < c
University	3.81 (0.46)	—

Predictive model: multiple regression

A multiple regression model was developed to predict risk perception based on cognitive dissonance, age, age at onset of consumption and educational level (coded as ordinal). The model was significant ($F(4,198) = 23.89, p < .001$) and explained 31% of the total variance (adjusted $R^2 = .31$).

Table 5. Multiple regression for risk perception

Variable	β	t	p
Cognitive dissonance	-0.35	-5.82	< .001
Age	0.11	1.89	.061
Age of onset of consumption	0.18	3.12	.002
Educational level	0.24	3.95	< .001

Psychological profile analysis

A k-means cluster analysis was applied to identify profiles among the participants. Three distinct groups were identified.

Table 6. Clusters.

Clúster	Profile	%	Level
Clúster 1	“Minimizers”	34	High cognitive dissonance and low risk perception
Clúster 2	“Conscientious but dependent”	40	High risk perception, but medium-high dissonance.
Clúster 3	“Alert and coherent”	26	Low dissonance and high-risk perception

Note: Differences between groups were significant for both variables ($F(2, 200) = 8.74, p < .001$), validating the existence of distinct cognitive profiles in the sample.

DISCUSSION

The findings of the present study provide a deeper understanding of the cognitive processes that influence risk minimization in female smokers. The negative relationship between cognitive dissonance and risk perception ($r = -0.43$, $p < .001$) confirms what was proposed by Festinger (1957), who postulated that people tend to reduce the discomfort caused by the contradiction between their beliefs and behaviors. In this case, many women continue to smoke despite knowing the risks, and as a cognitive strategy they underestimate these risks.

The association between age and cognitive dissonance ($r = -0.28$) suggests that younger women experience greater internal tension between knowledge of harm and their addictive behavior, which may be due to identity processes still in formation, greater social pressure, or less exposure to effective preventive campaigns.

On the other hand, age at smoking initiation was positively correlated with risk perception ($r = 0.22$), indicating that those who started smoking at an earlier age tend to naturalize the habit and perceive it as less harmful. This finding supports previous studies showing how early exposure to smoking negatively impacts awareness of its consequences (Becerra-Gálvez et al., 2023).

The multiple regression model showed that cognitive dissonance, age of onset and educational level together explain 31% of the variance in risk perception. This finding reinforces the importance of approaching tobacco use from a psychosocial perspective, considering both educational level and the internal narratives that legitimize the behavior.

Finally, the cluster analysis allowed us to identify three differentiated profiles: women who minimize risk, those who are aware of the harm but trapped in dependence, and a smaller group that maintains consistency between their knowledge and their assessment of risk. This segmentation provides relevant inputs for the design of specific interventions oriented to each profile.

Overall, the results reveal that cognitive dissonance not only influences the persistence of the habit, but also the way in which women construct their perception of risk, which can hinder or facilitate decision making for smoking cessation. It is recommended that prevention and cessation strategies incorporate elements that make dissonance visible, encouraging personal reflection and behavior change from a non-punitive approach

Regarding risk perception, ambivalence and the existence of minimizing beliefs are consistent with other studies that report that many smokers tend to underestimate or distort the risks associated with smoking to reduce anxiety related to their behavior (Davía-Cantos et al., 2022; Bernabé-Ortiz and Carrillo-Larco, 2022). This distortion may interfere with motivation to quit smoking and should be considered in the formulation of public health interventions.

Finally, the high rate of failed quit attempts, largely related to emotional factors, coincides with the evidence that highlights the need for therapeutic approaches that integrate emotional regulation techniques and gender perspective (Arellanez-Hernández et al., 2024; Restrepo, 2024). Behavioral activation and other approaches that focus on stress and anxiety management show promise for improving the effectiveness of cessation programs.

This study, despite having limitations inherent to the non-probability sampling and cross-sectional design, which restrict the generalization of results and causal inference, provides valuable updated data on smoking among Mexican women, especially from the perspectives of cognitive dissonance and risk perception. To strengthen future research, it is recommended to expand the samples with probabilistic methods and longitudinal designs that allow analyzing changes in behavior and cognitions over time. In addition, incorporating qualitative variables could delve deeper into the emotional and contextual motivations behind consumption, facilitating the design of more personalized and effective interventions. Overall, this study lays a solid foundation for understanding and addressing female smoking, providing a crucial empirical platform for improving gender-sensitive preventive and therapeutic strategies.

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