salud mental

Magnitude and extent of gambling disorder in the Mexican population

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ABSTRACT

Introduction. Gambling disorder is characterized by an uncontrollable need to gamble, lack of control over gambling, prioritizing gambling over other activities, and continuing to gamble despite the negative consequences this entails. Worldwide, between .1% and 5% of people show signs of problem gambling and between .1% and 2.2% present a positive result in gambling disorder criteria. **Objective.** To determine the extent of the problem of gambling disorder in Mexico and to identify and analyze the demographic groups in which it occurs. **Method.** ENCODAT 2016-2017 is a probabilistic, multi-stage survey with national and state representativeness. The sample comprises 56877 people who answered a standardized questionnaire that collects information on addictive substance use and other areas such as gambling disorder. **Results.** A total of 24.5% of the population aged 12 to 65 have played a betting game at lifetime. Men have higher statistically significant prevalences than women in nearly all types of gambling and in six of the nine symptoms of gambling disorder. In Mexico, .3% of the target population meet the criteria for gambling disorder, with adolescents showing the highest percentage (.4%). **Discussion and conclusion.** It is necessary to reinforce public policies for this issue that include the development of preventive actions targeting the adolescent and youth population in Mexico, and to ensure the adequate monitoring of authorized centers.

Keywords: Gambling disorder, survey, Mexico, betting types.

RESUMEN

Introducción. El juego patológico se caracteriza por la necesidad incontrolable de jugar, la falta de control sobre el juego, la prioridad de jugar sobre otras actividades y de continuar jugando a pesar de las consecuencias negativas. A nivel mundial, entre .1% y el 5% de las personas muestra señales de juego problemático y del .1% al 2.2% presenta un resultado positivo en los criterios de juego patológico. **Objetivo.** Conocer la extensión del problema del juego patológico en México e identificar y analizar los grupos demográficos en los que se presenta. **Método.** La ENCODAT 2016-2017 es una encuesta probabilística y polietápica con representatividad nacional y estatal. La muestra fue de 56877 personas, las cuales contestaron un cuestionario estandarizado que recaba información sobre consumo de sustancias adictivas y otras áreas como el juego patológico o ludopatía. **Resultados.** El 24.5% de la población de 12 a 65 años ha jugado algún juego de azar alguna vez en la vida. Los hombres presentan prevalencias estadísticamente significativas más altas que las mujeres en casi todos los tipos de juegos y en 6 de los 9 síntomas de juego patológico. En el país, el .3% de la población objetivo cumple con los criterios para juego patológico, y los adolescentes muestran el mayor porcentaje (.4%). **Discusión y conclusión.** Es necesario reforzar políticas públicas sobre el tema que incluyan el desarrollo de acciones preventivas dirigidas a la población adolescente y joven del país, así como incidir en el monitoreo adecuado de los centros autorizados.

Palabras clave: Juego patológico, encuesta, México, tipos de apuesta.

INTRODUCTION

Gambling disorder was acknowledged as a problem in 1992. The World Health Organization took the diagnostic criteria from the International Statistical Classification of Diseases and Related Health Problems ICD-10 and defined them as frequent, repeated episodes of betting that dominate the patient's life, leading them to ignore social, occupational, material, and familial aspects (World Health Organization, 2004). More recently, in the initial version of the ICD-11, it was indicated that gambling disorder is characterized by a pattern of persistent or recurrent gambling behavior that may be online (in other words, through the Internet) or offline, and that the individual has no control over it, prioritizes it over other activities and continues to engage in it despite the negative consequences it entails. The first diagnostic criteria for gambling disorder were presented in the Diagnostic and Statistical Manual DSM-III (American Psychiatric Association, 1980), classified within impulse control disorders. The DSM-5 (American Psychiatric Association, 2014) currently classifies it in the section of substance-related disorders and indicates that it is a recurrent, persistent dysfunctional gambling behavior that interrupts personal, family or work activities. It also recognizes it as a continuous problem according to the specificity of the gravity of the problem (mild, moderate, or severe) and in accordance with the established criteria (4-5 criteria, 6-7, and 8-9 criteria, respectively).

Moreover, Cruz et al. (2010) indicate that it is a behavioral alteration that occurs progressively and is characterized by an uncontrollable need to gamble regardless of the negative consequences it entails. For his part, Potenza (2008) says that the gambler risks something of value with the hope of obtaining something more valuable.

There are also other categories related to the type of gambler that are established according to the degree of interest and involvement in gambling. On the one hand, there is the social gambler, who only participates and bets to have a good time in accordance with his financial possibilities and is able to stop gambling when he decides to do so. There is also the professional gambler, who gambles on moves in which he has calculated that he has a possibility of winning, since this is his sole purpose. Conversely, the problem gambler has only minimal control over his gambling and the amounts of money he bets affect his economy (Santos, 2008).

The magnitude of the problem

An analysis of the extent of this problem shows that Europe is the place with the greatest interest in gambling disorder as a health concern. Data from UK indicate that in 2017, 45% of people aged 16 and over (48% men and 41% women) had participated in at least one form of gambling in the past four weeks; .8% of the people were identified as problem gamblers according to the Problem Gambling Severity Index (PGSI), while 3.9% identified themselves as low or moderate risk gamblers according to the criteria of the DSM-IV (Gambling Commission, 2018). However, prevalence studies have used different measuring instruments, each with its own classification criteria, such as the South Oaks Gambling Screen (SOGS), the Problem Gambling Severity Index (PGSI), the American Psychiatric Association's Diagnostic Criteria for Pathological Gambling (DSM-IV), the Diagnostic Interview Schedule for Pathological Gambling (DIS), the Diagnostic Interview for Gambling Severity (DIGS), the National Opinion Research Center DSM Screen for Gambling Problems (NODS), Gamblers Anonymous Twenty Questions (GA20), and the Lie/Bet scale. Readers are recommended to consult the original studies to see the evaluation criteria for each scale.

In Norway, for instance, it was found that 67.9% of people between the ages of 16 and 74 had participated in betting game in the past year, .7% of which were problem gamblers (Bakken, Götestam, Gråwe, Wenzel, & Øren, 2009), whereas in the Netherlands, the percentage of problem gamblers was .2% in 2005 and 2011, while that of at-risk gamblers was .4% in 2005 and .7% in 2011 (Goudriaan, 2013).

On the Americas, a study conducted in Brazil with 3 007 respondents indicated that 1.3% were classified as problem gamblers and the same percentage with gambling disorder, according to the DSM-IV criteria (Tavares et al., 2010).

Calado and Griffiths (2016) also reviewed 69 studies from different parts of the world in the general population and found variations in annual prevalence ranging from .1% to 5% of people who met the diagnostic criteria for problem gambling, the United States (5%), Hong Kong, and Finland (4% each) being the countries with the highest prevalence, compared with Switzerland (.1%) and Spain (.2%), where lower prevalences were found. The percentages of the population that met the criteria for gambling disorder were between .1% and 2.2%, with the highest prevalences being found in Hong Kong (2.2%) and Macao (1.8%) and the lowest in Denmark (.1%), while countries such as Germany, UK, and Norway had a prevalence of .2% each.

Although percentages for gambling disorder were higher in the adult population, several studies show the importance of attending the young population in view of their growing interest in gambling. For example, a study conducted in Canada (Huang & Boyer, 2007) with 5 666 young people ages 15 to 24, revealed that 61.3% had bet in the previous 12 months, while 2.2% (3.3% men and 1.1% women) showed moderate or problem risk. In UK, out of 8 958 adolescents between the ages of 11 and 15 years, 28.2% of boys and 12.7% of girls reported having partici-

pated in betting game in the previous seven days (Forrest & McHale, 2012). Lastly, in Chile, university students found that 10.5% of respondents could be classified as potential gamblers according to the DSM-IV-TR and DSM-5 criteria (Giacaman, Ñancupil, & Jobet, 2015).

Although these studies highlight the problem of gambling disorder, comparability between them is difficult because they have heterogeneous samples and the instruments used are different and their comparability has not been proven.

Factors and consequences related to gambling disorder

At the same time, although it is a recently studied phenomenon, the literature has reported some of the factors that may be associated with gambling disorder, including demographic ones such as sex, age, marital status, and educational attainment. A study conducted in the city of Tegucigalpa showed that those who frequented gambling places were mostly men, aged between 20 and 29, single, who had completed middle school, and had permanent employment (Cruz et al., 2010). Among university students in Italy, it was found that men are more likely to engage in these activities (Sarti & Triventi, 2017). In the United States, a study showed that men have more than twice as many gambling problems as women, that people between the ages of 31 and 40 are at the greatest risk, which decreases among the elderly, and that people with middle school education or less have approximately three times as many gambling problems as those with college or higher education (Welte, Barnes, Tidwell, & Wieczorek, 2017). Additionally, in samples obtained from people seeking treatment for gambling problems, it has been found that the higher the age of onset of gambling, the lower the severity of this behavior (Angulo, 2014).

As for psychological factors, a study conducted on participants with problems with gambling behavior found that these people have difficulties initiating affective relationships and that they present affective instability, introversion, insecurity about expressing feelings, and emotional dependence (Castaño, Calderón, & Restrepo, 2016). It has also been found that gambling disorder is associated with the presence of obsessive-compulsive disorder, anxiety, and depression (Hodgins et al., 2012).

Meanwhile, another study indicates that among middle-aged women (ages 30 to 59), high levels of stress and the use of negative coping strategies increase the likelihood of problem gambling (Afifi, Cox, Martens, Sareen, & Enns, 2010).

As for interpersonal factors, it has been found that the approval of betting game by family and friends, having relatives or friends with a history of gambling disorder (Hanss et al., 2015), a poor relationship between one's parents, as well as a poor relationship between parents and offspring, substance abuse or gambling by parents, and a bad financial situation (Dominguez, 2009; Hodgins et al., 2012) constitute risk factors for gambling disorder, whereas in those who perceive a high degree of family integration, there is less likelihood of engaging in betting game (Arcaya, Martina, Gutiérrez, & Romero, 2012).

As for the socio-environmental factors related to the availability of gambling and places for gambling, it has been found that the increase in gambling disorder is related to the availability of casinos, slot machines, and gambling halls (Castaño et al., 2016). In the particular case of Mexico, as of May 2018, the Secretaría de Gobernación (2018) had registered in the General Directorate of Games and Draws only 33 permit holders of number draws and betting centers (casinos), representing a total of 326 establishments in operation nationwide.

At the same time, gambling disorder has a significant impact on both gamblers and their relatives and close friends. Browne et al. (2016) states that the damage caused to gamblers and relatives occurs in eight areas: 1. financial damage, such as the reduction or loss of the ability to purchase essential items for the household; 2. relational conflicts, such as the lack of availability to spend time with one's partner and offspring; 3. emotional or psychological distress (anguish, shame, self-esteem problems, etc.); 4. poor health (little self-care as regards nutrition, hygiene, sleep, etc.); 5. cultural damage (low participation in cultural events and practices, etc.); 6. decrease in work or school performance; 7. criminal activity (presence of theft, fraud, etc.); and 8. life course, such as the loss of primary relationships and social connection.

As far as Mexico is concerned, research on gambling disorder is still scarce. We find reviews and suggestions for its monitoring (Ortega, Vázquez, & Reidl, 2009; Comisión Nacional contra las Adicciones, 2012), but there is undoubtedly a need to increase research on the subject. Having epidemiological studies and factors associated with gambling disorder will contribute to decision-making on public policies aimed at the prevention and attention of those who present this problem.

Although significant progress has obviously been made in the area, many elements remain to be researched and homogenized in the study of gambling disorder (analysis of comparable probabilistic samples; use of similar, standardized instruments; research on effective responses to the problem, etc.).

Given this situation, the present study, based on a national probabilistic sample and a reliable instrument derived from the symptoms defined in the DSM-5, seeks to answer the following questions in relation to the sociodemographic variables of socioeconomic index, age, and sex in the Mexican population: What are the most common betting types in the population? What is the magnitude and extent of

gambling disorder and its symptoms? What types of bet are most closely related to the presence of gambling disorder?

METHOD

The results reported in this paper form part of the Encuesta Nacional de Consumo de Drogas, Alcohol y Tabaco (ENCODAT) 2016-2017, undertaken on population ages 12 to 65 in urban and rural communities. For more information on the study method, see the original documents (Villatoro et al., 2017).

Population and sample

The survey has a probabilistic, multistage and stratified design. The universe selected for the primary sampling units (PSU) comprises the aggregate of the AGEBs (Basic Geo-statistical Areas). A sample size of approximately 1 600 individuals per state was chosen. In each household, whenever possible, an adult ages 18 to 65 and a teenager ages 12 to 17 were selected through simple random sampling in each age group. A total response rate (home + individual) of 73.6% was obtained. The final sample obtained was 56 877 complete interviews (23 820 men and 33 057 women), where 12 436 were adolescents and 44 441 adults.

Definition of variables

Gambling disorder

Recurrent, persistent dysfunctional gambling behavior that causes clinically significant deterioration or discomfort and is manifested when the individual has presented four or more symptoms within the past 12 months, according to the DSM-5 criteria.

Betting types for money

This refers to forms of gambling such as cards, horse or dog racing, cockfights, sports, casinos, etc., on which the individual has bet money or valuable belongings.

Socioeconomic index

Indicator using information about the possession of goods (own house, car, computer, DVD, and microwave oven) and access to services (Internet, cable TV, and telephone), comprising five levels: low, lower middle, middle, upper middle, and high (Díaz-Acosta, Shiba-Matsumoto, & Gutiérrez, 2015).

Age

Three age groups were established, from 12 to 17, 18 to 29, and 30 to 65 years old, the first two being designed to maintain the definition of youth established by the Instituto Mexicano de la Juventud (IMJUVE). For the purposes of this study, no further age groups were disaggregated, due to the low prevalence of the variable of interest.

Community

Rural (localities with fewer than 2 500 inhabitants); urban (localities with 2 500 or more inhabitants).

Instruments

The individual questionnaire was applied to the randomly selected individual, aged between 12 and 17 or 18 and 65 at the time of the visit. It collected data on sociodemographic information; tobacco, alcohol, and medical or illegal drug use; problems related to substance use, and personal, social and interpersonal aspects.

The gambling disorder scale comprises two sections. In the first, various betting types were measured, involving money or valuable belongings, which included the following indicators: 1. Have you bet when playing cards? 2. Have you bet on horse or dog racing, cockfights or other animals (at a racetrack, track, or with a bookmaker)? 3. Have you bet on sports (with the pools or with a bookmaker)? 4. Have you played dice for money? 5. Have you bet in a casino (whether authorized or not)? 6. Have you played the Lottery, Melate, or Tris? 7. Have you played bingo or traditional lottery for money? 8. Have you played on betting machines or slot machines (electronic, mechanical, or a combination of both)? 9. Have you bet when you have played bowling, billiards, golf, or other skill games? 10. Have you purchased instant raffle tickets such as Scratch Cards, etc.? 11. How often have you gone online to bet money? and 12. Other. Each one was measured according to whether or not the respondent had engaged in these behaviors, with a standardized Cronbach's Alpha of .76 for the scale. Moreover, the following question was asked in order to determine who they prefer to gamble with when they bet: When you play (cards/bingo/lottery/in slot machines), who do you prefer to do so with? With answer options 1 = Friends; 2 = Partner (husband/wife/boy/girlfriend); 3 = Relatives; 4 = Acquaintances; 5 = Strangers; 6 = Alone. Likewise, in order to determine the times when they usually bet, they were asked: When do you usually bet? The options were mornings, afternoons, nights, early mornings and all day; for these options, the answers were 1 = Yes and 2 = No.

The second section of this scale involved evaluating gambling disorder based on the DSM-5 indicators, which are as follows: 1. Your mind is often on betting (for example, you continually relive the experiences of past bets, condition, or plan your next bet, think of ways to get money to bet); 2. You feel the need to bet increasingly large amounts of money to obtain the desired excitement; 3. You feel nervous or irritated when you try to reduce or stop gambling; 4. You often bet when you feel uneasy (for example, helpless, guilty, anxious, or depressed); 5. After losing money

betting, you usually go back another day to try to win (to "recoup" your losses); 6. You lie to cover up your degree of involvement in gambling; 7. You have made repeated efforts to control, reduce, or stop gambling, always without success; 8. You have compromised or lost an important relationship, job, or academic or professional career due gambling; 9. You rely on others to give you money to relieve your desperate financial situation caused by gambling. All symptoms were answered as present/absent. Although the scale makes it possible to measure severity levels according to the number of symptoms that occur from four onwards (mild = 4 to 5, moderate = 6 to 7, and severe = 8 to 9), given the low prevalence of the phenomenon, in this study, symptoms were only measured as present or absent according to the criteria of four or more symptoms. This scale has a Cronbach's Alpha value of .72.

Procedure

In May 2016, a group of 323 interviewers, supervisors, cartographers, computer assistants, and coordinators were trained. The information was collected from June 1 to October 30, 2016. To this end, the cartographers paid an initial visit to selected blocks and localities to draw maps and make lists of dwellings to make the probabilistic selection of dwellings and identify risk areas. The interviewers applied the household questionnaire in the selected dwellings and once this stage had been completed, the computer application selected an adult and/or adolescent to apply the individual questionnaire. The supervisors verified each one of the non-response codes in the selected dwellings and among the selected household members. For each selected dwelling, at least four visits were scheduled at different times and on different days, including weekends, to increase the likelihood of finding the occupants. Field operating personnel were organized into eight routes, with each one consisting of a coordinator, two computer assistants, seven supervisors, and four interviewers per supervisor.

Ethical considerations

The survey was approved by the Research and Ethics Committees of the Instituto Nacional de Salud Pública (INSP) and the Instituto Nacional de Psiquiatría Ramón de la Fuente Muñiz (INPRFM). All the participants read a letter of informed consent and information was subsequently gathered on those who agreed to participate. In the case of minors, parents or guardians were asked for their authorization for their children to participate and if they agreed, they signed a letter of consent; minors' consent to participate in the study was also sought. In both cases, emphasis was placed on the objectives of the survey, the voluntary nature of participation, and the confidentiality of information.

Statistical analysis

The STATA 13 statistical program was used for the analyses, in each of which the sample design of the study was modeled. Estimates were obtained of the prevalence of each betting types, symptom of gambling disorder, and indicator of gambling disorder. Moreover, in order to analyze differences in the prevalence of these indicators between the different groups defined by demographic variables (sex, age, and socioeconomic index, using the community as a control variable in each model), adjusted prevalence rates (*PR*) were estimated based on generalized linear models (GLMs) with log link and binomial distribution. For GLMs, standard errors, and 95% confidence intervals (CI) were estimated. Additionally, in the analysis of the relationship between the type of game with bets and gambling disorder, χ^2 was used.

RESULTS

Betting types games preferred by the population

Nationwide, 24.5% of the population aged 12 to 65 have ever bet for money (men 32%, women 17.4%). By age group, young people aged 12 to 17 years have the highest prevalence (35.3%) compared with adults ages 18 to 29 (28.6%) and 30 to 65 years (18.8%).

Betting machines or slot machines are the most frequent form of gambling (11.8%), followed by the Lottery/Melate/Tris (8.3%) and cards (7.3%). Online gambling (.8%), dice (1.8%) and gambling in casinos (2.5%) have the lowest prevalences.

In the analysis with the prevalence ratio (*PR*) adjusted by community (Table 1), it was found that men play significantly more than women on betting machines or slot machines (*PR* = 1.77, 95% CI [1.64, 1.92]), and that the higher the socioeconomic index, the higher the prevalence ratio for playing on them (Lower middle: *PR* = 1.20; 95% CI [1.07, 1.35]; Middle: *PR* = 1.30; 95% CI [1.15, 1.47]; Upper middle: *PR* = 1.44; 95% CI [1.27, 1.64]; High: *PR* = 1.46; 95% CI [1.27, 1.69]). By age, people ages 18 or older are less involved in this type of gambling than those ages 12 to 17 (18 to 29 years old: *PR* = .61; 95% CI [.56, .67]; 30 to 65 years old: *PR* = .17; 95% CI [.15, .19]).

Among those who play Lottery/Melate/Tris, men are more likely to do so than women (*PR* = 1.75, 95% CI [1.54 - 1.99]), as well as the population with a high socioeconomic index. In the category of cards, the risk of gambling is higher among men, as well as among those aged between 30 and 65 and those with a high socioeconomic index.

Although the remaining types of gambling (horse racing, sports, dice, casino, bingo or lottery, skill games, in-

Table 1
Prevalence ratio of ever engaging in gambling by sex, age and socioeconomic index

	n	N	Cards (7.3%)¹				Horse or dog racing, cockfighting (3.5%)				Sports (with pools or bookmakers) (5.1%)				Dice (1.8%)			
			%	PR	95% CI	p	%	PR	95% CI	p	%	PR	95% CI	p	%	PR	95% CI	p
Sex																		
Female	29 414	44 093 441	3.0	1.0	—	—	.9	1.0	—	—	1.7	1.0	—	—	.7	1.0	—	—
Male	27 463	41 168 617	11.9	3.82	3.33 - 4.39	***	6.3	7.17	5.89 - 8.72	***	8.8	5.04	4.17 - 6.09	***	3.0	3.94	3.04 - 5.10	***
Age																		
12-17	9 563	14 335 079	8.9	1.0	—	—	2.8	1.0	—	—	5.8	1.0	—	—	2.1	1.0	—	—
18-29	16 806	25 192 818	10.2	1.12	.98 - 1.28	—	4.5	1.66	1.37 - 2.02	***	7.1	1.17	1.00 - 1.36	*	2.6	1.21	.92 - 1.59	—
30-65	30 509	45 734 160	5.2	.59	.50 - 68	***	3.1	1.17	.98 - 1.40	—	3.8	.65	.55 - .78	***	1.3	.59	.46 - .76	***
Socioeconomic index																		
Low	11 931	17 885 054	5.3	1.0	—	—	3.1	1.0	—	—	3.3	1.0	—	—	1.2	1.0	—	—
Lower middle	13 460	20 177 318	6.4	1.19	.98 - 1.44	—	3.5	1.16	.95 - 1.42	—	4.3	1.29	1.04 - 1.60	*	1.4	1.15	.78 - 1.69	—
Middle	12 259	18 376 622	7.5	1.34	1.06 - 1.69	—	3.1	1.09	.88 - 1.35	—	5.6	1.64	1.24 - 2.17	***	1.7	1.31	.91 - 1.88	—
Upper middle	9 937	14 896 516	8.6	1.54	1.27 - 1.87	***	3.6	1.29	1.02 - 1.62	*	6.2	1.78	1.40 - 2.26	***	2.0	1.54	1.02 - 2.33	*
High	9 125	13 678 532	9.6	1.62	1.32 - 1.98	***	4.4	1.56	1.19 - 2.04	***	6.7	1.80	1.42 - 2.29	***	3.1	2.26	1.47 - 3.48	***

	n	N	In a casino (2.5%)				Lottery, Melate, Tris (8.3%)				Bingo or traditional lottery (5.9%)				Betting machines or slot machines (11.8%)			
			%	PR	95% CI	p	%	PR	95% CI	p	%	PR	95% CI	p	%	PR	95% CI	p
Sex																		
Female	29 414	44 093 441	1.6	1.0	—	—	6.1	1.0	—	—	5.6	1.0	—	—	8.3	1.0	—	—
Male	27 463	41 168 617	3.4	2.11	1.71 - 2.62	***	10.8	1.75	1.54 - 1.99	***	6.3	1.09	.98 - 1.22	—	15.5	1.77	1.64 - 1.92	***
Age																		
12-17	9 563	14 335 079	.3	1.0	—	—	8.7	1.0	—	—	9.7	1.0	—	—	26.6	1.0	—	—
18-29	16 806	25 192 818	3.6	11.34	5.73 - 22.45	***	8.5	.93	.80 - 1.07	—	7.2	.71	.62 - .81	***	16.5	.61	.56 - .67	***
30-65	30 509	45 734 160	2.5	7.93	3.98 - 15.81	***	8.2	.91	.80 - 1.02	—	4.0	.39	.35 - .44	***	4.5	.17	.15 - .19	***
Socioeconomic index																		
Low	11 931	17 885 054	1.2	1.0	—	—	4.8	1.0	—	—	4.1	1.0	—	—	9.3	1.0	—	—
Lower middle	13 460	20 177 318	1.5	1.18	.81 - 1.72	—	6.8	1.36	1.11 - 1.67	**	4.8	1.14	.95 - 1.37	—	11.4	1.20	1.07 - 1.35	**
Middle	12 259	18 376 622	1.9	1.42	.99 - 2.03	—	9.2	1.76	1.46 - 2.13	***	6.1	1.43	1.18 - 1.72	***	12.2	1.30	1.15 - 1.47	***
Upper middle	9 937	14 896 516	2.8	1.94	1.37 - 2.73	***	10.9	2.03	1.72 - 2.40	***	7.8	1.84	1.53 - 2.22	***	13.2	1.44	1.27 - 1.64	***
High	9 125	13 678 532	5.8	3.55	2.45 - 5.15	***	11.3	2.00	1.68 - 2.39	***	7.8	1.82	1.49 - 2.22	***	13.3	1.46	1.27 - 1.69	***

	Skill games (bowling, billiards, golf, etc.) (3.1%)				Instant draws (7.1%)				Online bets (.8%)				Other (.9%)			
	%	PR	95% CI	p	%	PR	95% CI	p	%	PR	95% CI	p	%	PR	95% CI	p
Sex																
Female	1.0	1.0	—	—	5.4	1.0	—	—	.4	1.0	—	—	.4	1.0	—	—
Male	5.4	4.98	3.91 - 6.34	***	8.8	1.62	1.43 - 1.84	***	1.2	2.88	2.02 - 4.11	***	1.5	3.6	2.39 - 5.33	***
Age																
12-17	3.9	1.0	—	—	5.9	1.0	—	—	.9	1.0	—	—	1.9	1.0	—	—
18-29	5.4	1.29	1.06 - 1.56	**	6.7	1.09	.92 - 1.30	—	1.4	1.50	.98 - 2.29	—	1.3	.67	.45 - 1.00	*
30-65	1.6	.39	.32 - .46	***	7.6	1.25	1.10 - 1.43	***	.4	.43	.30 - .61	***	.4	.20	.14 - .30	***
Socioeconomic index																
Low	1.7	1.0	—	—	4.3	1.0	—	—	.7	1.0	—	—	.7	1.0	—	—
Lower middle	2.2	1.31	1.01 - 1.70	*	5.6	1.27	1.06 - 1.53	**	.6	.82	.49 - 1.38	—	.8	1.09	.69 - 1.73	—
Middle	2.9	1.70	1.27 - 2.28	***	8.0	1.74	1.40 - 2.15	***	.6	.85	.51 - 1.41	—	1.1	1.60	.93 - 2.76	—
Upper middle	4.4	2.63	1.97 - 3.51	***	9.0	1.86	1.54 - 2.26	***	.6	.79	.49 - 1.28	—	1.0	1.48	.98 - 2.23	—
High	5.2	2.94	2.20 - 3.93	***	9.6	1.86	1.52 - 2.29	***	1.5	2.01	1.05 - 3.86	*	1.0	1.39	.89 - 2.19	—

Note: Every estimate in the multiple binomial regression model is adjusted by type of community. ¹Percentage of the population that reported having engaged in this type of gambling. The study population corresponds to N = 85 262 058 people aged 12 to 65. *PR:* Prevalence ratio; *p < .05; **p < .01; ***p < .001.

Table 2
Prevalence ratio of symptoms and diagnostic criteria of gambling disorder by sex, age and socioeconomic index

	n	N	Frequent thoughts of betting (10%)[1]				Need to bet (4.2%)				Feeling restless or irritable (3.4%)				Betting to escape from problems (2.5%)				Going back to recoup losses (8.5%)			
			%	PR	95% CI	p	%	PR	95% CI	p	%	PR	95% CI	p	%	PR	95% CI	p	%	PR	95% CI	p
Sex																						
Female	5 117	7 671 209	7.5	1.0	–	–	2.5	1.0	–	–	1.7	1.0	–	–	2.6	1.0	–	–	6.5	1.0	–	–
Male	8 801	13 193 380	11.2	1.50	1.16 - 1.94	**	5.0	2.04	1.39 - 2.99	***	4.2	2.44	1.55 - 3.87	***	2.4	.92	.50 - 1.70	–	9.5	1.47	1.10 - 1.97	**
Age																						
12-17	3 374	5 058 458	12.1	1.0	–	–	5.0	1.0	–	–	3.9	1.0	–	–	1.7	1.0	–	–	12.2	1.0	–	–
18-29	4 800	7 195 491	8.5	.72	.56 - .93	*	4.1	.83	.56 - 1.24	–	3.6	.91	.52 - 1.60	–	1.8	1.13	.66 - 1.93	–	7.4	.60	.45 - .80	***
30-65	5 744	8 610 639	9.8	.86	.65 - 1.15	–	3.7	.78	.47 - 1.27	–	2.7	.71	.46 - 1.10	–	3.7	2.38	1.31 - 4.33	**	6.7	.55	.41 - .75	***
Socioeconomic index																						
Low	2 184	3 273 861	12.4	1.0	–	–	5.7	1.0	–	–	3.7	1.0	–	–	3.8	1.0	–	–	9.9	1.0	–	–
Lower middle	3 084	4 622 579	12.9	1.07	.75 - 1.54	–	6.1	1.10	.65 - 1.87	–	3.5	.98	.63 - 1.53	–	3.5	.92	.37 - 2.28	–	10.8	1.11	.75 - 1.65	–
Middle	3 139	4 704 959	9.0	.76	.53 - 1.08	–	3.5	.64	.40 - 1.03	–	3.2	.94	.54 - 1.64	–	1.9	.49	.21 - 1.11	–	6.6	.71	.49 - 1.01	–
Upper middle	2 777	4 162 794	8.4	.70	.49 - 1.00	*	2.5	.44	.26 - .75	**	3.0	.87	.34 - 2.23	–	1.3	.31	.13 - .75	**	5.8	.63	.44 - .91	*
High	2 690	4 032 977	7.1	.60	.40 - .91	*	3.3	.57	.33 - 1.01	–	3.5	1.01	.56 - 1.80	–	2.1	.48	.20 - 1.20	–	9.4	1.05	.72 - 1.52	–

	n	N	Lying to conceal taste for betting (3.1%)				Has tried unsuccessfully to stop betting (3.2%)				Has lost a significant relationship (.6%)				Has borrowed money (1.7%)				Gambling disorder DSM-5 (4 or more symptoms) (.3%)[2]			
			%	PR	95% CI	p	%	PR	95% CI	p	%	PR	95% CI	p	%	PR	95% CI	p	%	PR	95% CI	p
Sex																						
Female	5 117	7 671 209	2.5	1.0	–	–	1.7	1.0	–	–	.2	1.0	–	–	1.0	1.0	–	–	.1	1.0	–	–
Male	8 801	13 193 380	3.4	1.38	.71 - 2.67	–	4.0	2.36	1.54 - 3.61	***	.8	3.47	1.33 - 9.05	*	2.0	1.82	.99 - 3.36	–	.5	6.78	3.81 - 12.07	***
Age																						
12-17	3 374	5 058 458	4.2	1.0	–	–	4.2	1.0	–	–	.5	1.0	–	–	1.9	1.0	–	–	.4	1.0	–	–
18-29	4 800	7 195 490	2.5	.61	.35 - 1.07	–	3.3	.76	.47 - 1.22	–	.8	1.69	.66 - 4.34	–	2.1	1.13	.56 - 2.31	–	.3	.75	.41 - 1.38	–
30-65	5 744	8 610 639	2.9	.77	.40 - 1.50	–	2.4	.59	.37 - .95	*	.5	1.22	.56 - 2.66	–	1.1	.59	.30 - 1.17	–	.2	.45	.21 - .97	*
Socioeconomic index																						
Low	2 184	3 273 861	3.7	1.0	–	–	3.2	1.0	–	–	.5	1.0	–	–	2.8	1.0	–	–	.2	1.0	–	–
Lower middle	3 084	4 622 579	5.1	1.40	.72 - 2.73	–	4.7	1.50	.87 - 2.61	–	.9	1.91	.73 - 5.00	–	1.9	.69	.30 - 1.61	–	.4	1.64	.72 - 3.72	–
Middle	3 139	4 704 959	2.3	.63	.36 - 1.12	–	2.6	.86	.51 - 1.46	–	.9	2.14	.63 - 7.26	–	1.3	.48	.20 - 1.17	–	.2	.65	.33 - 1.28	–
Upper middle	2 777	4 162 794	2.0	.57	.28 - 1.13	–	3.2	1.06	.57 - 1.99	–	.3	.75	.23 - 2.42	–	.7	.27	.12 - .63	**	.1	.57	.29 - 1.11	–
High	2 690	4 032 977	2.4	.69	.33 - 1.43	–	2.5	.83	.43 - 1.58	–	.3	.79	.23 - 2.80	–	1.8	.69	.27 - 1.79	–	.4	1.56	.79 - 3.07	–

Note: Every estimate in the multiple binomial regression model is adjusted by type of community. [1]Lifetime percentage of the population that has bet and reported having presented the symptom in the past 12 months. The population analyzed in each symptom is the one that has bet at lifetime (*N* = 20 864 589). [2]The prevalence of gambling disorder was obtained from the total population ages 12 to 65 (*n* = 56 877, *N* = 85 262 058). *PR*: Prevalence ratio; *p < .05; **p < .01; ***p < .001.

Table 3
Proportion of gambling disorder by type of bet

Type of bet	Has not bet			Has bet			χ^2	p
	n	N	%	n	N	%		
Cards	70	101 541	.7	91	134 771	2.2	228.4	***
Horse or dog racing, cockfighting	99	120 788	.7	62	115 525	3.9	643.1	***
Sports (with pools or bookmakers)	110	151 060	.9	51	85 252	2.0	91.9	*
Dice	121	183 796	1.0	40	52 517	3.4	209.7	***
In a casino	125	176 231	.9	36	60 081	2.9	169.9	**
Lottery, Melate, Tris	87	100 737	.7	74	135 575	1.9	157.7	**
Bingo or traditional lottery	97	153 660	1.0	64	82 652	1.6	41.3	.084
Betting machines or slot machines	50	80 217	.7	111	156 095	1.6	84.3	*
Skill games (bowling, billiards, golf)	105	139 806	.8	56	96 506	3.6	463.9	***
Instant draws	112	130 005	.9	49	106 307	1.8	82.4	*
Online	144	209 874	1.0	17	26 439	4.0	135.7	***
Other	137	208 290	1.0	23	22 671	2.9	65.7	**

Note: The population analyzed is one that has bet at lifetime (N = 20 864 589, n = 13 115). Population with gambling disorder N = 236 313.
*p < .05; **p < .01; ***p < .001.

stant draws, and online betting) have a lower prevalence in the population, in the models analyzed, men also have significantly higher prevalence rates than women, with the exception of bingo or lottery, where men and women have a similar prevalence.

Magnitude of gambling disorder and its symptoms

Regarding the population that has bet money or valuable belongings, it was found that having frequent thoughts of betting (10%), going back to recoup losses (8.5%), and the need to gamble (4.2%) are the most frequent symptoms of gambling disorder, while those with a lower prevalence include losing a significant relationship (.6%), borrowing money (1.7%), and betting to escape problems (2.5%).

Likewise, the prevalence ratio analysis of the results of this section shows that men have a higher rate than women in six of the nine symptoms of gambling disorder. Losing a significant relationship, feeling restless or irritable, and trying unsuccessfully to quit gambling were the symptoms with the highest prevalence ratios. By age group, taking the 12 to 17 year age group as a reference, young people ages 18 to 29 have a lower proportion of frequent thoughts of betting and less intention of returning to recoup their losses. At the same time, those ages 30 to 65 years also showed less of a desire to recoup their losses and less difficulty quitting betting than adolescents, in addition to having a higher prevalence in the symptom of betting to escape problems. Lastly, those with an upper middle socioeconomic index presented significantly fewer gambling symptoms than those with a low socioeconomic index, particularly as regards the need to bet, betting to escape problems, going back to recoup losses, and borrowing money to continue gambling (Table 2).

Regarding the presence of gambling disorder, .3% of the population presents four or more symptoms, which is significantly higher in men (.5%) than in women (.1%) (PR = 6.78, 95% CI [3.81, 12.07]). By age group, adolescents had the highest prevalence of gambling disorder (.4%), significantly higher than the group ages 30 to 65 (.2%, PR = .45, 95% CI [.21, .97]) (Table 2).

Betting types with the highest proportion of gambling disorders

Among the population that has ever bet, the study analyzed which betting types are related to the presence of gambling disorder. It was found that the highest percentages of gambling disorder were gambling online (4%), betting on horse or dog racing, cockfights (3.9%), and betting on skill games (3.6%), while betting on betting machines or slot machines (1.6%), immediate draws (1.8%), and playing sports (pools or bookmakers) (2%) have the lowest percentages (Table 3).

As for the preferred times for playing, the highest percentage of gambling disorder corresponds to those who gamble all day (3.8%, χ^2 = 62.1, p = .009). Moreover, the analysis of who they prefer to gamble with shows that the highest percentage do so with strangers (3.7%) (Table 4).

DISCUSSION AND CONCLUSION

Betting types

The results of this study showed that the main betting games are betting machines or slot machines, the Lottery/Melate/Tris, and card games. Slot machines obtained a prevalence of 11.8% among the population, with adolescents showing

Table 4
Gambling preferences and gambling disorder

	Does not prefer that schedule			Prefers that schedule				
	n	*N*	%	*n*	*N*	%	χ^2	*p*
Preferred gambling times[1]								
Mornings	143	199 974	1.1	18	36 339	1.7	20.0	.253
Afternoons	72	103 270	1.3	89	133 043	1.0	12.6	.352
Evenings	96	163 020	1.1	65	73 292	1.1	0.0	.952
Early morning	159	233 926	1.1	2	2 387	.9	.4	.774
All day	153	222 755	1.1	8	13 558	3.8	62.1	**
Who do you prefer to gamble with?[2]								
Partner (spouse/boy/girlfriend)				3	6 686	.8	218.4	***
Relatives				30	31 092	.5		
Acquaintances				9	6 105	.6		
Strangers				6	9 721	3.7		
Alone				17	24 170	.6		

Note: The population analyzed has bet at lifetime (*N* = 20 864 589, *n* = 13 115). The *N* with gambling disorder (four or more symptoms) was *N* = 236 313. [1]Respondents could choose more than one schedule option; [2]The comparison involves the proportion of gambling disorder between each category of the persons whom respondents prefer to gamble with.
*p < .05; **p < .01; ***p < .001.

the highest preference for them (26.6%). It is important to note that betting machines or slot machines are not allowed in Mexico. Moreover, the Secretaría de Gobernación (2018) regards them as a great risk to society, since they can cause rapid addiction to gambling, due to the false expectation of earning easy money. It also considers them a source of corruption of minors, particularly adolescents, who are at a greater risk of developing gambling problems than adults (Becoña, Míguez, & Vázquez, 2001).

It was found that men engage most in the various types of games except for bingo. In this ratio between men and women, it is interesting that, in bets that involve playing in a casino, the Lottery or Melate, slot machines, and instant draws, this proportion is lower than in other betting types.

On the other hand, although adults were expected to play more, the results show that, in general terms, the highest prevalence was found in the young population ages 18 to 29, which is consistent with the results obtained in other studies (Huang & Boyer, 2007; Cruz et al., 2010; Forrest & McHale, 2012; Ekholm et al., 2014; Sarti & Triventi, 2017).

It is also observed that those with a higher socioeconomic index use more diverse betting types, particularly playing dice and betting in a casino, probably as a result of their greater purchasing power (Welte, Barnes, Wieczorek, Tidwell, & Parker, 2002; Welte, Barnes, Wieczorek, Tidwell, & Hoffman, 2011).

Magnitude and extent of gambling disorder

A quarter of the Mexican population aged between 12 and 65 years has bet money at lifetime, and .3% present gambling disorder, equivalent to just over 230 000 people. This prevalence of dependence on gambling is low, which represents an opportunity to work more on prevention. Moreover, they are located in the lowest part of the range

obtained in studies from various countries (from .1% to 2.2%) (Bakken et al., 2009; Tavares et al., 2010; Goudriaan, 2013; Calado & Griffiths, 2016; Gambling Commission, 2018).

Of the nine symptoms of gambling disorder, men had higher prevalences than women in six. Likewise, although gambling behaviors occurred more frequently at older ages, adolescents presented greater symptomatology and presence of gambling disorder in comparison with the adult population ages 30 to 65 (.4% *vs*. .2%, respectively), which has also been observed in previous studies (Huang & Boyer, 2007; Ekholm et al., 2014; Giacaman et al., 2015; Husky, Michel, Richard, Guignard, & Beck, 2015; Sherba & Martt, 2015). Research has shown that when individuals begin gambling at an early age, their behavior can become more severe in the adult stage and facilitate the development of gambling disorder and other problems related to gambling (Angulo, 2014; Browne et al., 2016).

An important variable for becoming involved in betting is the search for new sensation, a characteristic feature of adolescence, which can lead them to engage in various risk behaviors (Angulo, 2014). Preventive intervention in this age group is therefore essential, both in providing psychoeducational information on the consequences of short-, medium-, and long-term gambling, and in supporting them in the development of socio-emotional skills. These skills allow them, on the one hand, to cope with the various difficulties they experience at this stage of their lives and, on the other, to strengthen their emotional stability (Afifi et al., 2010; Castaño et al., 2016).

Betting types and gambling disorder

Although the prevalences of gambling dependence or gambling disorder are low, it was observed that the betting pop-

ulation, who bet on horses, dice, skill games, and online, or go to a casino, have higher percentages of approximately 3.3%. Something similar occurs with those who report gambling all day or who bet with strangers. These are precisely the elements that must be constantly monitored among the population that engages in betting to prevent their playing from becoming a mental health concern that affects their health and environment.

Likewise, these findings should prompt the analysis and monitoring of the availability of gambling places, tolerance, and acceptance of betting behaviors by the community and family, since they can facilitate the triggering of a problem gambling pattern (Hanss et al., 2015; Welte et al., 2017), and affect both family relationships and those with one's peer group (Castaño et al., 2016).

In this context, analyzing the availability of betting places is important for Mexico, since 27 of the country's 32 states have authorized concessions for operating casinos and betting games. Sonora, Jalisco, and Baja California are states with more than 30 establishments each (Secretaría de Gobernación, 2018), not counting clandestine betting places.

The data presented here are important for determining the magnitude of the problem of gambling disorder, as well as its relationship with various sociodemographic variables. Nevertheless, it is important to have an in-depth knowledge of the social, interpersonal, and personal variables related to this behavior. When analyzing the limitations of this study, it is important to consider that the low prevalence found makes it impossible to obtain a large sample of people with gambling disorder to evaluate other important factors related to the topic and map the states in which this problem is most present.

Likewise, although the instrument used in this study is based on the symptoms described in the DSM-IV and DSM-5 (which allows for comparison with other studies using these indicators) and has adequate reliability, it is important to undertake a clinical study that evaluates its sensitivity and specificity in order to more accurately gauge evaluations of this nature.

Lastly, studies on this issue must continue in order to make it possible to intervene in time and provide guidelines for better prevention actions in adolescents, a group with a higher prevalence of gambling disorder.

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Conflict of interests

The authors declare that they have no conflict of interests.

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