



Risk behaviors in youth from Mexico City: a retrospective study

Conductas de riesgo en jóvenes de la Ciudad de México: un estudio retrospectivo

Artículo resultado de investigación

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Abstract

In the transition from adolescence to adulthood, an increase in several risk behaviors endangers the well-being of future life. It is in this period when there are changes in the relationships of adolescents with their family environment; therefore, retrospective studies are valuable to understand how these changes occur. This research describes the changes in risk behaviors associated with sexual activity and the consumption of tobacco, alcohol and illegal drugs, from youth to adulthood. A sample of 5780 students, men and women, from Mexico City was used. The selection of participants was retrospective and they were evaluated in three stages during years (2003, 2006 and 2010) in a period of seven years. Eleven indicators of and Automated Medical Examination (EMA) were used to evaluate the four risk behaviors. The results showed significant relationships ($p < 0.001$) between the risk behaviors and the gender of the students, also indicated that men had a greater number of risk behaviors than women. Likewise, significant differences were found in the risk behaviors ($p < 0.001$) over time. The findings allowed us to observe an increase in risk behaviors in the transition from adolescence to adulthood, both in men and women.

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Keywords:

Restrospective studies; Risk behavior; Sex; Students; Youth.

Resumen

La transición de la adolescencia a la edad adulta puede acrecentar el involucramiento en las conductas de riesgo, hecho que compromete el bienestar a lo largo de la vida, por lo que los estudios retrospectivos son valiosos, ya que permiten entender cómo ocurren estas injerencias. Esta investigación describe los cambios en conductas de riesgo asociadas a la actividad sexual y al consumo de tabaco, alcohol y drogas ilegales, presentes desde la adolescencia hasta la adultez, en una muestra conformada por 5780 estudiantes, hombres y mujeres, de la Ciudad de México. La selección de los participantes fue de manera retrospectiva y fueron evaluados en tres etapas (2003, 2006 y 2010) en un periodo de siete años. Se utilizaron 11 indicadores del Examen Médico Automatizado (EMA) para evaluar las cuatro conductas de riesgo mencionadas. Los resultados mostraron relaciones significativas ($p < 0,001$) entre las conductas de riesgo y el género sexual de los estudiantes, e indican que los hombres tuvieron un mayor número de comportamientos de riesgo que las mujeres. Asimismo, se encontraron diferencias significativas en los comportamientos de riesgo ($p < 0,001$) a través del tiempo. Los hallazgos permitieron observar un aumento de los comportamientos de riesgo en la transición de la adolescencia a la edad adulta, tanto en hombres como en mujeres.

Palabras clave:

Estudios retrospectivos; Conductas de riesgo; Sexo; Estudiantes; Jóvenes.

Introduction

The transition from adolescence to adulthood is a period that brings about significant health challenges linked to the emergence of some risk behaviors (Benjet, Borges, Méndez, Casanova, Medina-Mora, 2014; Benjet et al., 2016; Resnick et al., 1997). Some authors (Igra & Irwin, 1996; Jessor, 1998) suggest that using tobacco, alcohol, and illegal drugs, and engaging in unprotected sex are risk behaviors because they compromise health, welfare, and youth development. Early involvement in any of these conducts is associated with negative consequences on adolescence and adulthood, such as substance dependence and abuse, poor physical or mental health, low levels of education, and labor issues (Collishaw, Maughan, Goodman, & Pickles, 2004; Fergusson & Woodward, 2001; Hale, Fitzgerald-Yau, & Viner, 2014; Kessler, Angermeyer & Anthony, 2007; Sourander, 2012).

According to the National Health and Nutrition Examination Survey (ENSANUT) (Gutiérrez et al., 2012), in 2012, 23% of teenagers in Mexico had already started their sexual life, out of which 14.7% males and 33.4% females reported not using any birth control methods. Among the adolescents who reported using them, the condom was the most popular (80.6%), followed by hormonal methods (6.2%). The National Survey of Addictions in 2011 reported that 12.3% of Mexican adolescents (12-17 years) used tobacco, with an average age of first use of 14.1 years and an average consumption rate of 4.1 cigarettes per day.

The results of this survey also indicate that, in 2011, 42.9% of teenagers had consumed alcohol at least once. Of this number, 30% did it over the course of the year prior to answering the survey and 19.5% in the last month. The average age of first alcohol consumption was 17.7 years. Regarding the consumption of illegal drugs, data indicates that 1.5% of adolescents in México in 2011 had used one illegal drug in the year prior to the survey. The preferred drugs were marijuana (1.37%), cocaine (0.4%), and inhalants (0.3%). Other studies (Instituto Nacional de Psiquiatría Ramón de la Fuente Muñiz, Instituto Nacional de Salud Pública, Secretaría de Salud, 2012a, 2012b, 2012c) have shown sex differences in regard to drug use, whereby men have greater drug-related problems than women.

Risk behaviors do not occur in isolation, i.e., young people who report one risk behavior are likely to present others (Guilamo-Ramos, Litardo, & Jaccard, 2005). This could be caused in part to a decrease in the perception of risk (Pudney, 2003), so that a teenager who consumes tobacco and drinks alcohol is more likely to participate in the subsequent consumption of illicit drugs (Wagner & Anthony, 2002). Moreover, the study of the paths of risk behaviors in students from a developmental perspective, which allows for a better understanding of the dynamic

and interactive changes in adolescents, has led some authors (Maggs & Schulenberg, 2004; Merline, Jager & Schulenberg, 2008; Schulenberg & Maggs, 2001; 2002) to conceive them as highly context-reactive subjects. These model suggest that a focus on process and, particularly, on the process involved in the changing relations between individuals and their contexts, is at the cutting edge of contemporary developmental theory.

For example, most contemporary research about human development in general, and about adolescent development more specifically, is associated with theoretical ideas stressing that the dynamics of individual-context relations provide the bases of behavior and developmental change.

According to Grant, Harford and Grigson (1988), longitudinal studies have shown that consumption patterns change when people get involved in their work environment and when they have an emotional relationship that stabilizes them. Some researchers (Grant et al, 1988; Windle, 1990) have reported that the use of illegal drugs at an early age is predictive of drug and alcohol consumption in late adolescence, although others (Labouvie, Bates, & Pandina, 1997) noted that this is not predictive of the persistence or severity of consumption in adulthood. However, consumption of illegal drugs at age 18 is a predictor of the presence of problems related to drug consumption at age 21 (White, Brick & Hansell, 1993). For a longitudinal study that analyzed the substance-consumption path taken by teenagers, Oliva, Parra, and Sánchez (2008) collected data when participants were 13, 15, and 18 years of age. Results showed an upward trend in drug use. Although some participants reduced consumption, especially within the 15-to-18-age period, complete abandonment of drugs was quite unusual.

However, most studies are cross-sectional, which makes it hard to determine whether associated risk factors are concurrent with such conducts or a result of them. Therefore, it is important to conduct retrospective studies to keep track of the population studied over time and thus obtain a valid estimate of associated problems across different risk behaviors (Arnau & Balluerka, 2004; Arnau & Bono, 2008; Farrington, 1991). This study aims to gain deeper knowledge of changes in indicators of risk behaviors (use of tobacco, alcohol, and drugs, and sexual behavior) from adolescence to adulthood, among students in Mexico City.

Method

Study Design

The design of the study was not experimental since only information was obtained from the participants without having an intervention in the phenomenon studied. In addition, it was retrospective since the patterns in the risk behaviors were recorded, without knowing the factors that explained a given behavior.

Participants

Researchers worked with an intentional non-probabilistic sample of 5780 students from Mexico City's metropolitan area. Data was obtained in a retrospective manner over a seven-year period. In 2010, researchers spotted students who were in the senior year of their undergraduate studies. Students had been given a file number, so researchers were able to track them back to the time when they began high school (2003) and college (2006). For the first measure, researchers obtained information from 17,670 youths; for the second measure, they obtained the information of 11,489 adolescents, equivalent to 65% of the initial sample. For the third and last measure, researchers got the information of 5780 students, who comprised the final sample, corresponding to 32.7% of the initial sample.

Those students whose complete information could not be obtained (67.3% of the initial sample) either lost their status as regular students or were reported as academic casualties. Out of the 5780 students in the final sample, 37.5% were males and 62.5% were females. The average student ages for the three measures were 15.1 years (SD=1.15) for the first wave, 18.0 years (SD=1.13) for the second wave, and 22.1 years (SD=1.16) for the last wave.

Data collection

Researchers collected the data at the beginning of the semester for each of the three stages. The first and second instruments were administered during students' admission to high school, in 2003, and college, in 2006. The third measurement took place in 2010, when students were completing their fourth year of college

at a public university in Mexico City. University authorities agreed to have students answer the survey. For the three measurements, psychologists and medical doctors administered them in the campus premises, such as classrooms and auditoriums.

Measures

Researchers used indicators of the Automated Medical Examination (EMA) to collect information on participants' physical health, mental health, family, and social environment. To evaluate sexual behavior, students answered three questions concerning presence of behavior, age of first intercourse, and use of birth control methods. To assess tobacco consumption, participants responded three questions about presence of behavior, age of first use, and number of cigarettes smoked per day. Researchers assessed alcohol consumption through four questions concerning age of first use, frequency, quantity and abuse. For illegal drugs consumption, three questions measured presence of behavior, age of first use, and type of illegal drug used.

Table 1. Indicators of risk behaviors evaluated

Risk Behavior	Value	Description
Sexual	0	They have not had sex
	1	If they have had sex, they began their sexual life after 15 years of age and always use condoms
	2	If they have had sex, they began their sexual life after 15 years of age and occasionally use condom
	3	If they have had sex, they began their sexual life before 15 years of age and always use condoms
	4	If they have had sex, they began their sexual life before 15 years and occasionally use condom
Tobacco	0	They have never consumed tobacco
	1	Have consumed but no longer do
	2	Smoke, began consumption after 15 years of age and consume between one and three cigarettes a day
	3	Smoke, began consumption after 15 years of age and consume four or more cigarettes a day
	4	Smoke, began consumption before 15 years of age and consume between one and three cigarettes a day
Alcohol	0	Have never consumed alcohol
	1	Have consumed but no longer do
	2	Drink alcohol, began consumption after 15 years and does not drink more than three cups per occasion
	3	Drink alcohol, began consumption after 15 years of age and drink more than three cups per occasion
	4	Drink alcohol, began consumption before 15 years of age and does not drink more than three cups per occasion
Illegal Drugs	0	Have never consumed illegal drugs
	1	Have consumed but no longer do
	2	Use illegal drugs and started consumption after 15 years of age
	3	Use illegal drugs and started consumption before 15 years of age

Based on information from the questions above, each of the risk behaviors were evaluated to generate indicators, which resulted from the combination of various aspects such as behavior's presence, age of onset, and amount of consumption (in the case of tobacco and alcohol) (see Table 1).

Statistical analysis

Descriptive analyzes were performed to determine the distribution of participants by sex and age. In addition, chi-square analyzes were performed to determine the relationship between indicators of risk behaviors and gender. To analyze changes over time with each of the indicators of risk behaviors, Friedman tests were performed.

Ethical considerations

Researchers informed participants that the information they provided would be integrated into their clinical record and that its use and administration would be done according to the Mexican Official Standard on Health Record (Norma Oficial Mexicana NOM-168-SSA1-1998) [46]. This implies that information contained in the clinical record must be handled with discretion and confidentiality and only used for medical actions, teaching, and research. Based on the information provided, participants verbally expressed their consent to participate in this research.

Results

The relationship between gender and each of the indicators was analyzed (risk sexual behavior, use of tobacco, alcohol and illegal drugs) for each of the measurements. As shown in Table 2, statistically significant relationships in the three measurements were found ($X^2= 37.78$, $p<.001$ for wave 1; $X^2= 121.68$, $p<.001$ for wave 2; $X^2= 224.13$, $p<.001$ for wave 3). In general, the number of males who got involved in risky sexual behavior was higher than the number of females who did it. Conversely, the proportion of females who had not started their sex life was higher than that of males.

Regarding the risk indicator of tobacco use, the findings showed significant relationships in the first and in the third measurements ($X^2= 23.73$, $p<.001$ for wave 1; $X^2= 25.37$, $p<.001$ for wave 3). As in the case of risk sexual behavior, more male students than female students used tobacco while the proportion of women who reported not having used tobacco on these measurements was higher than that of men (see Table 2). However, in the second wave, the relationship found was not statistically significant ($X^2= 2.84$, $p>.05$) and the data showed that the distribution was similar for men and women.

As seen in Table 2, the results showed statistically significant relationships in the risk indicator of alcohol consumption by sex in all three measurements ($X^2= 75.74$, $p<.001$ for wave 1; $X^2= 220.23$, $p<.001$ for wave 2; $X^2= 236.68$, $p<.001$ for wave 3). The first measurement shows a greater proportion of women who have not consumed alcohol than that of men, which changes for the next two measurements, wherein a higher percentage of men reported no alcohol consumption compared to that of women. In the category of increased risk of alcohol consumption, there was a higher proportion of males than that of females placed in this category for all three measures.

As for the risk indicator of consumption of illegal drugs, results showed statistically significant relationships in the three measurements ($X^2= 7.54$, $p<.05$ for wave 1; $X^2= 18.38$, $p<.001$ for wave 2; $X^2= 59.34$, $p<.001$ for wave 3). These findings indicate a larger proportion of women who reported they have not used illegal drugs in contrast to that of men. Additionally, more men than women reported to be currently using drugs. (Table 2).

Table 2. Indicators of risk behaviors among men and women in the three measurements

	Value*	Wave 1		Wave 2		Wave 3	
		Males %	Females %	Males %	Females %	Males %	Females %
Sexual risk behavior	0	91.6	94.7	54.2	64.8	19.4	29.2
	1	4.6	2.9	7.6	9.2	49.4	39.2
	2	1.3	1.4	33.7	24.3	23.8	29.9
	3	1.9	0.6	1.2	0.6	9.7	0.7
	4	0.6	0.3	3.4	1.1	3.6	1.1
Consumption of tobacco	0	65.6	70.4	81.5	80.5	50.3	54.6
	1	27.4	24.6	0.9	1.1	21.5	21.4
	2	3.2	2.3	14.3	15.4	19.2	17.7
	3	0.7	0.3	0.4	0.3	4.7	4.0
	4	2.6	2.1	2.6	2.5	2.9	1.7
	5	0.5	0.2	0.2	0.2	1.4	0.7
Consumption of alcohol	0	54.5	58.0	56.7	28.7	16.2	14.7
	1	21.6	18.2	7.2	8.5	4.6	5.5
	2	6.7	9.1	28.4	40.4	35.5	53.0
	3	4.1	1.8	24.0	12.6	31.0	20.0
	4	9.3	11.1	4.7	5.5	4.9	3.5
	5	3.8	1.9	9.0	4.4	7.8	3.2
Consumption of illegal drugs	0	98.1	98.9	91.9	94.6	84.2	90.7
	1	1.7	0.9	—	—	13.2	8.1
	2	0.1	0.1	7.6	5.2	2.4	1.2
	3	—	—	0.4	0.2	0.2	0.1

Note. *To check what each of the values of the risk behavior indicators refers to, see Table 1.

In order to analyze the differences over time in each of the indicators of risk behaviors and due to the level of measurements of the indicators, Friedman tests were performed. Due to significant differences in the frequency of indicators for men and women, it was decided to perform the comparison analysis separately. With regard to the results of men (see Table 3), statistically significant differences in sexual risk behavior were found [$X^2(2) = 1779.81, p < .001$], wherein a steady increase was observed in sexual risk behavior from the first to the third wave. There were significant differences for risk indicator of consumption of tobacco [$X^2(2) = 380.19, p < .001$], where a decrease was found in the risk indicator from the first to the second wave. However, for the third wave there was an increase that exceeded the median of the first wave. As for the risk indicator of alcohol consumption, results showed significant differences in the three measurements [$X^2(2) = 1118.83, p < .001$], which found a steady increase in the risk indicator in the three measurements. Regarding the risk indicator of illegal drugs, analyzes showed significant differences in the three measurements [$X^2(2) = 285.33, p < .001$], whereas the risk indicator of alcohol consumption showed an increase from the first to the second wave and from the second to third wave.

Table 3. Differences in time for each Indicator of risk behaviors in men

	Wave 1	Wave 2	Wave 3
	Md	Md	Md
Sexual Behavior	1.44	2.10	2.46
Tobacco	1.91	1.85	2.24
Alcohol	1.53	2.13	2.34
Illegal drugs	1.89	2.02	2.09

As for the findings in women (see Table 4), sexual risk behavior showed statistically significant differences [$X^2(2) = 3006.44, p < .001$], and a steady increase was observed in the risk indicator for the three measurements. For the risk indicator of tobacco consumption, significant differences were found [$X^2(2) = 506.66, p < .001$]; as happened with risky sexual behavior, there is a constant increase in the three moments evaluated.

As for the risk indicator of alcohol consumption, results showed significant differences in the three measurements [$X^2(2) = 1743.60, p < .001$]. There is a steady increase in the risk indicator in the three measurements. Finally, for the risk indicator of illegal drugs, analyzes showed significant differences in the three measurements [$X^2(2) = 272.25, p < .001$]; as in the other risk indicators, an increase was found from the first wave to the second and from the second to the third.

Table 4. Differences in time for each Indicator of risk behaviors in women

	Wave 1	Wave 2	Wave 3
	Md	Md	Md
Sexual Behavior	1.51	2.01	2.48
Tobacco	1.89	1.91	2.20
Alcohol	1.56	2.10	2.35
Illegal drugs	1.93	2.02	2.05

Discussion

The findings of this investigation should be understood in light of the population and context from which they emerge: teenage students in Mexico City analyzed over a period of seven years. Due to the nature of the population, generalizations cannot be made; however, the information provided in this research sheds light on how various phenomena related to the welfare of teens present themselves. In this study categories were developed to assess different risk behaviors (sexual behavior, use of tobacco, alcohol and illegal drugs) to analyze their relationship with students' gender. Results show that a large proportion of men have behaviors and characteristics that put them at greater risk than women. This trend is clear for all risk indicators evaluated.

When drawing a comparison with other studies regarding the initiation in risk behaviors, we observe that the consumption of illegal drugs shown in the three measures is consistent with national data (Instituto Nacional de Psiquiatría Ramón de la Fuente Muñiz, Instituto Nacional de Salud Pública, Secretaría de Salud, 2012c). As regards tobacco consumption, about half of the young men and women at the end of their undergraduate studies reported that they had not started smoking. This value is slightly higher in percentage for women. These findings are similar to reports from nationwide studies (Instituto Nacional de Psiquiatría Ramón de la Fuente Muñiz, Instituto Nacional de Salud Pública, Secretaría de Salud, 2012b). Men still show higher consumption rates than women. However, the number of teens who reported that they had not started tobacco consumption is lower on this study than it is on the latest National Survey of Addictions (Instituto Nacional de Psiquiatría Ramón de la Fuente Muñiz, Instituto Nacional de Salud Pública, Secretaría de Salud, 2012a).

Regarding sexual behavior as measured at the end of college, approximately one quarter of women and one-fifth of men reported that they had not started their sexual life. These are much lower figures than those presented in national reports (Gutiérrez et al., 2012); however, these differences may be due to the age ranges evaluated.

Regarding alcohol consumption, the findings show that, in the last measure, a very low percentage of students stated that they had never used this substance (16% for men and 14% for women). It is interesting that in the first measure, when students were 15 years old on average, about half of them reported having consumed alcoholic drinks, which indicates that this risk behavior had a great presence then. As suggested by some scholars (Collishaw et al., 2004; Fergusson & Woodward, 2001; Hale et al., 2014; Kessler et al., 2007; Merline, 2008; Sourander et al., 2012; Schulenberg & Maggs, 2002), initiating risk behaviors at a young age may be a risk factor for young people getting involved in a number of behaviors that put their wellbeing at risk. Along the same line, Benjet et al. (2016, 2014) noted that the number of teens who reported having consumed alcohol increases with age. Similar results have been reported in the United States with both Saxon and Hispanic populations.

On the other hand, empirical evidence suggests that there are different ways of analyzing the trajectories of adolescents. One approach points to a normative path, emphasizing factors associated to consumption to explain its evolution, although it should be noted that not all teens follow the same path. Another approach establishes the existence of multiple routes due to the differences of the groups where the adolescents develop (Maggs & Schulenberg, 2004).

It is important to note that the previously mentioned studies were conducted primarily in developed countries; in the case of Mexico, there are few studies of this nature, of which the majority analyze different samples, thus limiting the universe of comparison with the results of this research.

For the analysis of indicators of risk behaviors in the three stages, the results showed a steady increase in all the behaviors evaluated (risk sexual behavior and use of tobacco, alcohol, and illegal drugs) for both men and women. These results allow us to understand the transition of young people through different levels of risk behaviors that could endanger their health. Although teenagers are likely to get involved in some of these conducts as part of their development process, it is important to note that risk behaviors do not necessarily remain constant.

The study had some limitations. First, students' identification remained confidential but not anonymous during the administration of the surveys, which might have affected their responses. However, researchers clearly stated to participants that the information provided was not for identification; therefore, follow-ups are not possible. In addition, the fact that all the participating students belonged to the same higher education institution limits the possibility to generalize the results to other populations.

Conclusions

The findings of this study provide a descriptive view of the changes over time in a student population concerning their involvement in behaviors that endanger their well-being. One of the factors that showed to be important in the evolution of involvement in said behaviors was students' gender. Being a male appears to be a factor that increases the probability of involvement in behaviors that harm health. The results of the present study also suggest that more longitudinal studies should be carried out to analyze not only the changes in risk behaviors but also the factors associated with this type of behavior in relation to participants' age. These studies could be useful for the development of interventions, especially for captive student populations.

Conflict of interest

The authors declare that there is no conflict of interest regarding the publication of this article.

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