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Piña, Julio Alfonso; Dávila, Mariana; Lozano, Dora Isabel; Carillo, Irene Concepción; Vázquez, Patricia
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Relationship with multiple partners in university women: a comparative study in two institutions from the northwest of Mexico

JULIO ALFONSO PIÑA, MC¹, MARIANA DÁVILA, LP¹, DORA ISABEL LOZANO, PhD²,
IRENE CONCEPCIÓN CARILLO, MPC², PATRICIA VÁZQUEZ, MC²

SUMMARY

Objective: To identify what variables influence having multiple sexual partners.

Methods: A cross-sectional study was carried out with 542 women of two higher education institutions from the northwest of Mexico, who answered a questionnaire measuring psychological variables underlying high-risk sexual behaviors. The data were analyzed with T-tests, Mann-Whitney U tests, and with a multiple linear regression.

Results: A multiple linear regression analysis showed the following results: for women from Hermosillo, Sonora, the predictors of high-risk sexual behaviors were biological age, age of sexual debut, and one biological state - «I was physically excited»-, with those variables explaining 53.4% of the total variance; for women from Ciudad Juárez, Chihuahua, the predictors were biological age, and two types of biological states -«I was physically excited» and «I was under the influence of alcohol», explaining 20.8% of the total variance.

Conclusions: The results underscore the need to design prevention programs directed to avoid HIV infection based on behavioral competencies training.

Keywords: Risky sexual behaviors; Multiple partners; Biological states; HIV infection; Behavioral competencies.

Relaciones con múltiples parejas en mujeres universitarias: estudio comparativo en dos instituciones del noroeste de México

RESUMEN

Objetivo: Identificar qué variables influyen para que las mujeres se relacionen sexualmente con múltiples parejas.

Métodos: Estudio transversal que contó con la participación de 542 mujeres pertenecientes a dos instituciones de educación superior del noroeste de México, a quienes se administró un instrumento que mide variables psicológicas que subyacen a diferentes comportamientos sexuales de riesgo. Para el tratamiento de los datos se utilizaron la prueba T, la U de Mann-Whitney y un análisis de regresión lineal múltiple.

Resultados: El análisis de regresión arrojó los siguientes resultados: para las mujeres de Hermosillo, Sonora, los predictores fueron las variables edad biológica, edad de inicio de relaciones y un estado biológico -«me encontraba excitada»-, con esas variables explicando 53.4% de la varianza total. Para las mujeres de Ciudad Juárez, Chihuahua, los predictores fueron las variables edad biológica y dos estados biológicos -«me encontraba excitada» y «me encontraba bajo la influencia del alcohol»-, explicando 20.8% de la varianza total.

Conclusiones: Los resultados del presente estudio subrayan la necesidad de diseñar programas para prevenir nuevas infecciones por VIH, con base en el entrenamiento en competencias conductuales.

Palabras clave: Comportamientos sexuales de riesgo; Múltiples parejas; Estados biológicos; Infección por VIH; Competencias conductuales.

One of the keys to prevent sexually transmitted diseases -STDs-, has to do with the reduction of the number of sexual partners¹. The problem, however, is that adolescents and young adults of both sexes keep

1. Independent Researchers. Hermosillo, México. e-mail: ja_pina@hotmail.com mardaptap@hotmail.com

2. Department of Psychology, Universidad Autónoma de Ciudad Juárez, Ciudad Juárez, México.
e-mail: dlozano@uacj.mx icarrillo@uacj.mx pvazquez@uacj.mx

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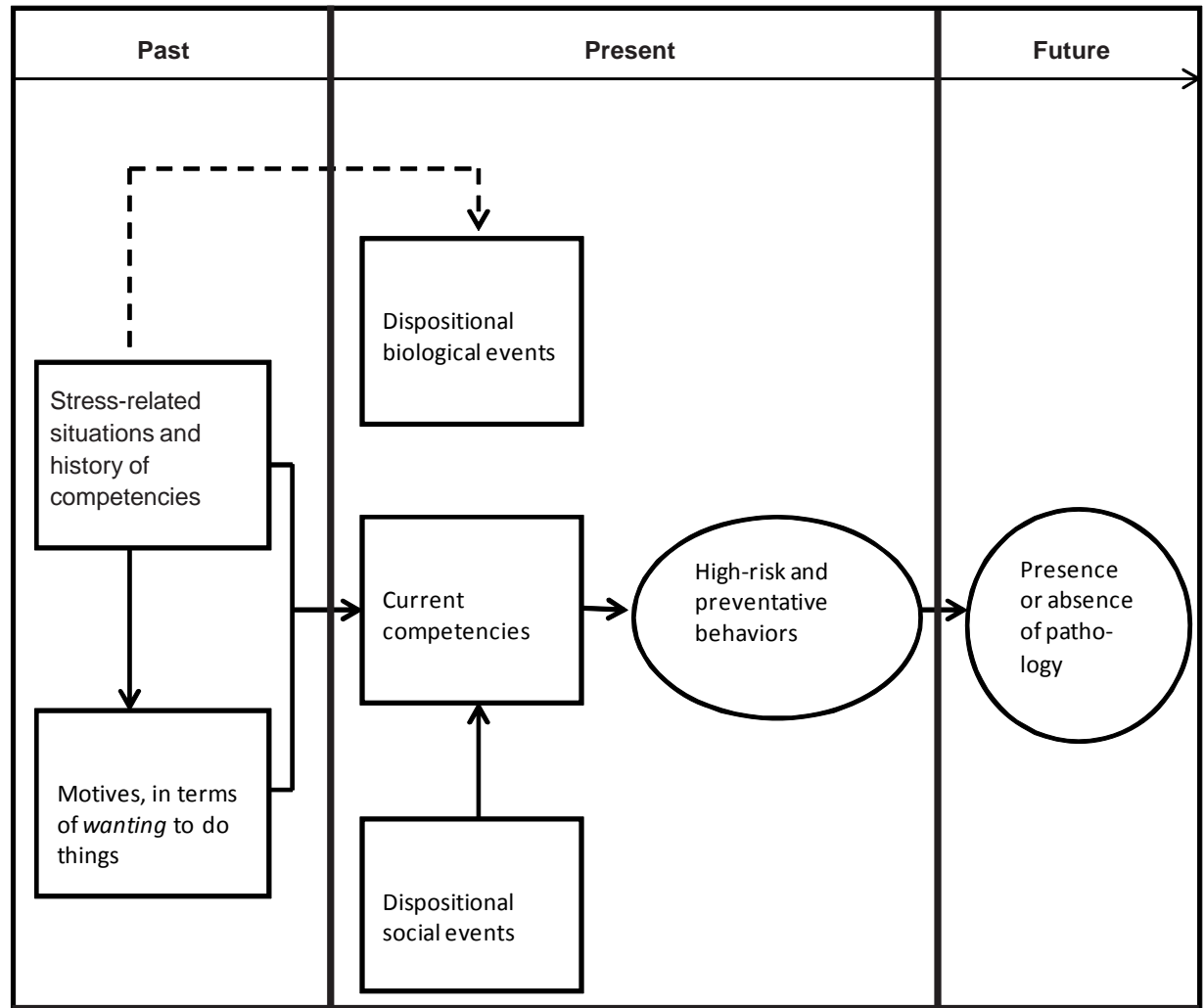


Figure 1. Graphic representation of the psychological model of prevention

engaging in sexual relations with multiple partners in situations that place them at risk for contracting an STD, and in particular the human immunodeficiency virus (HIV). The situations we are referring to are those in which a person, prior to engaging in a sexual relation, interacts with others in social situations with friends, significant others, or casual acquaintances, frequently mediated by biological states associated with sexual deprivation, or with the consumption of substances such as drugs or alcohol; these are states that facilitate the practice of different high-risk sexual behaviors, such as engaging in sexual relations with multiple partners or not using a condom consistently and efficiently²⁻⁴.

Each time that we are dealing with a problem that

demand special attention from psychologists interested in the area of health, we must first have parsimonious models that allow us to systematically evaluate which variables facilitate or impede the practice of these or other high-risk sexual behaviors. These models will allow us to fulfill two tasks: on the one hand, they help in offering plausible explanations in terms of why and under what circumstances people behave as they do; on the other hand, they allow us to translate our findings into viable intervention proposals aimed at changing high-risk behaviors into preventative ones⁵.

Such is the case with the psychological model of disease prevention⁶, whose elements are separated into three phases (Figure 1): in the past phase are situations

linked to stress, to the history of competencies, and to motives. *Situations linked to stress* correspond with what is known in the literature as personality⁷, defined as consistent modes of interacting in situations in which there are no prescribed criteria as to how to behave; one example is the situation known as risk-taking tendencies, in which a person confronted with two situations or two circumstances within a situation in which there is a certain probability of obtaining immediate positive consequences (sexual pleasure) or positive consequences in the long term (avoiding an STD diagnosis), opts for the former.

Past competencies are identified with the knowledge and skills acquired by people when they interact in situations in which there are certain criteria to be met; their role is to facilitate or impede the instrumental exercise of certain behaviors; they include, among other things, knowing what HIV is, what AIDS is, how to prevent and HIV infection, knowing that condoms prevent HIV infection and having used it correctly and effectively when engaged in sexual relations with one or more persons, etc.

Motives, for their part, are defined as the election of or preference for objects, events or people in situations in which there are socially valued consequences; when it is said that a person is motivated to practice a certain behavior, it is assumed that he/she wants to do one thing in a social situation in which such behavior is evaluated as opportune and pertinent⁸, as would be the case of using a condom because it has positive long term consequences related to the prevention of STDs, including HIV infections.

In the second phase there are four variables considered:

- a. dispositional social events, which in turn include social circumstances, the place in which the behavior takes place, and the presence of other people;
- b. current competencies;
- c. dispositional biological events;
- d. instrumental behaviors of risk or prevention.

When a person's behavior is analyzed in a social situation, we must take into account the specific social circumstances in which the person is interacting (whether the relationships consist of family, friends, work, business, school, etc.), the type of setting or place in which the interaction takes place and the people with whom the person comes in contact, whether they are acquaintances or not.

Current competencies are conceived as the practical manifestation of past competencies in the form of a variety of behaviors that allow a person to adjust to different criteria efficiently; they imply the knowing *what* things are and *how* to do them. Knowing, for instance, that using a condom reduces the risk of HIV infection; however, even if there is knowledge, the person is considered competent only to the extent that he/she behaves consistently and congruently, that is, that he/she uses a condom each and every time he/she engages in sexual relations with penetration.

Dispositional biological events have to do with the biological conditions that are present prior to an interaction: what the person ate, how sleepy they are, how fatigued, whether they are sick, and whether they are in an altered state due to the presence of medication or substances such as alcohol or drugs, mainly. These are conditions that can also facilitate or impede the instrumental exercise of high-risk or preventative behaviors. In the particular case of high-risk sexual behaviors, two conditions that especially influence their practice have to do with the use of substances such as alcohol or drugs.

Finally, high-risk behaviors can be of two kinds. First there are those high-risk behaviors that directly place a person in contact with a pathogen and second are those whose practice in the long run increases the organism's vulnerability to a biological pathology, especially those that are defined as chronic. Of interest here are the former because they constitute the immediate reference points from which the potential risk that a person will be diagnosed with an HIV infection is assessed; we are referring to, among others, starting an active sexual life at an early age, having sexual relations with multiple partners and not using a condom consistently and effectively.

Starting from the elements of the above mentioned psychological model as a framework the present cross-sectional study was conducted, with the object of identifying predictors of having sexual relations with multiple partners in two groups of women from two higher-learning institutions in the northwest of Mexico.

METHOD

Participants. A cross-sectional study was conducted with a representative sample of students enrolled in two

Table 1
Sociodemographic characteristics of the participants

Variables		Total sample	CESUES	UACJ
Participants (n-%)		542 (100.0)	179 (33.0)	363 (67.0)
Age		X = 20.90	21.13	20.79
		SD = 2.29	2.29	2.29
		R = 17-30 ^a	17-30	17-30
Year of study (n-%)	1	94 (17.3)	44 (24.6)	50 (13.8)
	2	114 (21.0)	16 (8.9)	98 (27.0)
	2	96 (17.7)	24 (13.4)	72 (19.8)
	4	121 (22.3)	44 (24.6)	77 (21.2)
	5	117 (21.6)	51 (28.5)	66 (18.2)
Income (n-%) ^b				
	None	276 (50.9)	111 (62.0)	165 (45.5)
	< \$1,500.00	47 (8.7)	20 (11.2)	27 (7.4)
	\$1,500.00-3,000.00	100 (18.5)	33 (18.4)	67 (18.5)
	\$3,000.00-5,000.00	71 (13.1)	10 (5.6)	61 (16.8)
	> \$5,000.00	48 (8.9)	5 (2.8)	43 (11.8)
Religion (n-%)				
	None	61 (11.3)	10 (5.6)	51 (14.0)
	Catholic	437 (80.6)	158 (88.3)	279 (76.9)
	Non-Catholic	44 (8.1)	11 (6.1)	33 (9.1)

^a Range

^b In Mexican pesos

Universities in Northwestern Mexico: the Centro de Estudios Superiores del estado de Sonora (CESUES), in Hermosillo, Sonora, y the Universidad Autónoma de Ciudad Juárez (UACJ), in Ciudad Juárez, Chihuahua, both cities located in the northwest region of Mexico. Participant selection was conducted with probabilistic sampling, multi-stage and stratified⁹; to that end, the total population of students was stratified by area and year of study, as well as by time of class (morning vs. evening classes). Inclusion criteria were:

- to be officially enrolled in one of the majors offered by the two universities;
- to be between 17 and 30 years old;
- to consent voluntarily to participate in the study, and
- to answer all of the questions.

There were 1489 participants who met these criteria (691 from CESUES and 798 from UACJ), from which for the purposes of the present study we selected only women who reported having sexual experience, with

the final sample consisting of 542 students [179 (33%) belonging to the first institution and 363 (67%) to the second]. The mean age of the sample was 20.90 years (Standard deviation=2.29; minimum age 17 years; maximum age=30 years); the rest of the participant socio-demographic data are summarized in Table 1.

Instrument and variables. To measure the variables of interest and the behavior of engaging in sexual relations with multiple partners we used an instrument that was designed and validated in Mexico¹⁰, consisting of 44 questions that included socio-demographic information, motives, biological states and social situations that underlie different high-risk behaviors: age of first sexual relation with penetration, condom use during the first sexual encounter, condom use across an active sexual life, condom use with casual acquaintances, as well as sexual relations with multiple partners and with casual acquaintances. For the purposes of the present study we examined motives, biological states and social

situations that underlie having sexual relations with multiple partners.

Having relations with multiple partners was considered the *independent variable*. For the purposes of analysis, this variable was defined with an ordinal scale and a Likert-type format with three possible answers: one (just one partner), two (between 2 and 4 partners) and three (5 or more partners). *Dependent variables* were biological age (age at the time the study was conducted), age of first sexual relation, motives, biological states and social situations that either increased or decreased the likelihood of the above mentioned behavior; the last three variables were measured on an ordinal scale, as described below.

One example of a question measuring motives was: of the following motives listed below, could you tell us how important each of them was in determining whether you engaged in a sexual relation with different partners?, with answer options that included «because the opportunity was there», «because I wanted to experiment» and «because I was physically attracted to them», each of which was assessed with a Likert-type scale ranging from one (it was not a determinant motive) to four (it was a determinant motive).

One example of a question measuring biological states was: of the biological states listed below, could you tell us how much each of them influenced your decision to engage in sexual relations with multiple partners? with answer options that included «I was physically excited», «I was under the influence of alcohol» and «I was under the influence of a drug», each assessed with a Likert-type scale with four choices ranging from one (it did not influence me at all) to four (it influenced me too much).

Finally, an example of a question measuring social situations is: of the social situations listed below, could you tell us how much each facilitated your decision to engage in sexual relations with different partners?, with answer options that included «I was in a private room», «I was mingling in a gathering», «I was in an adults-only location» and «I was walking with them», each of which was assessed with a Likert-type scale with four choices ranging from one (it did not facilitate it at all) to four (it facilitated it a lot).

Procedure. The research Project was approved by the Research and Ethics Committee of the Health-Care Institution in Hermosillo, Sonora, as well as by the

Bioethics Committee of the Universidad Autónoma de Ciudad Juárez, in Ciudad Juárez, Chihuahua. Following approval by the committee the heads of each of the chosen majors from both institutions were approached, the goals of the study were explained to them, and their approval for the application of the instrument was sought.

Once approval was obtained, the principal investigators and their collaborators went to the selected classrooms and requested the voluntary participation of the students, making sure they knew that their answers would be anonymous and confidential. Those students who agreed to participate were then given an informed consent form to read and sign; the time of administration of the instrument ranged from 25 to 50 minutes.

Statistical analysis. Data were processed with SPSS for windows, version 15.0. In a first phase we used an independent samples T test to determine whether there were differences in biological age and age of first sexual encounter between the students from both institutions. The Mann-Whitney U test was used to determine whether there were differences in having sexual relations with multiple partners between the two institutions, because this test is recommended when analyzing a nominal (two values) and an ordinal variable¹¹.

Finally, a multiple linear regression analysis (backward method) was used to identify predictors of the above mentioned behavior; this analysis was carried out twice: firstly the set of predictors was included directly, and lastly with institution as a criterion variable; to evaluate goodness of fit of the data to the model the coefficient of determination (adjusted R²) was used, which is an estimate of how well a model fits data from a studied population. To detect multicollinearity between the dependent and independent variables the tolerance index was used, the values of which range from 0 to 1, with values less than one indicating a linear relation between the variables, whereas values higher than 1 indicate the absence of a relationship. Similarly, the Durbin-Watson statistic was used with the purpose of assessing the level of correlation of the residuals and the diagrams for particular cases which meet selection criteria (corresponding to atypical values that are above n standard deviations); the significance of the statistic is determined by its value: if it is near 2, then the results are not correlated, if it is near 4 they are negatively correlated, and finally, if it is near 0 they are positively correlated¹².

RESULTS

Age of first sexual relations and differences between students by institution. At the time the study was conducted, the mean age of initiating an active sexual life was 18.10 years (SD= 1.88; minimum age= 12 years old; maximum age= 24 years) (Table 1). When comparing participants from both institutions it was found that students from CESUES initiated their sex life at a mean age of 18.53 years (SD=1.88; minimum age=14 years; maximum age=24 years), while students from UACJ initiated their sex life at a mean age of 17.89 years (SD=1.84; minimum age=12 years; maximum age=24 years); an independent sample T test showed that this was a significant difference ($t [540]=3.270$; $p<0.001$), indicating that the students from the latter institution start their sexual lives earlier than students from the former institution.

Relations with multiple partners and differences between students by institution. In regard to having sexual relations with multiple partners, the results were as follows: in general, 286 (52.8%) of the students had become involved with only one partner, 197 (36.3%) with 2 or more partners and 59 (10.9%) with 5 or more partners. As a function of institution, it was found that students from CESUES had lower percentages of sexual relations in the three response options: 105 (59.2%) vs. 180 (49.5%) with only one partner; 55 (36.7%) vs. 142 (39.1%) with 2 to 4 partners, and 18 (10.1%) vs. 41 (11.3%) with 5 or more partners.

When comparing this behavior with the Mann-Whitney U test a significant difference was found between participants from both institutions ($U=29509.500$; $Z=-1.937$; $p<0.05$), with a range of $X=254.86$ and 279.71 for students from CESUES and from UACJ, respectively; in that sense, students from the latter institution had been involved with more partners throughout their active sex lives.

Predictors of the behavior «having sexual relations with multiple partners». With respect to the multiple linear regression analysis (backward method), the overall results were as follows (Table 2): for the total sample, the predictors of having multiple sexual partners were biological age, age of first sexual relations and two biological states (I was excited and I had consumed alcohol).

In Table 2a are the results of the ANOVA, as well

as the values of the tolerance index and the Durbin-Watson statistic. The ANOVA was significant [$F (5, 112)=11.376$; $p<0.001$], with a coefficient of determination (adjusted $R^2=0.307$), meaning that these variables explain 30.7% of the total variance; the tolerance indexes for each of the variables were in every case below one, suggesting positive correlations between the dependent and independent variables, whereas the Durbin-Watson statistic was 1.908, showing that the residuals were independent.

When including institution as a criterion variable, the results were as follows (Table 3). For participants from CESUES the predictors were biological age, age of first sexual relations and one biological state (I was excited). The ANOVA was also significant [$F=10.161 (4, 28)$; $p<0.001$], whereas the coefficient of determination (adjusted $R^2=0.534$), explaining 53.4% of the total variance (Table 3a); similar to the previous analyses, the tolerance indexes for each of the variables were all less than 1, suggesting positive correlations between the dependent and independent variables, whereas the Durbin-Watson statistic was 1.665, suggesting that the residuals are independent, as their value is close to 2.

In the case of participants from UACJ (Table 4), the predictors were age of first sexual relations and two types of biological states (I was excited and I had consumed alcohol). As shown in Table 4a, the ANOVA was significant [$F=8.335 (3, 81)$; $p<0.001$], with a coefficient of determination (adjusted $R^2=0.208$), showing that the three variables explained 20.8% of the total variance. As was the case in the two previous analyses, the tolerance indexes should be interpreted for each of the variables, and in all cases they were below 1, and the Durbin-Watson statistic was 1.829, showing that the residuals were independent (its value was close to 2).

DISCUSSION

At the time the study was conducted, 47.2% and 10.9% of the participants from both institutions had become sexually involved with either between 2 and 4 partners or with more than 5 partners, respectively, which shows that in that section of the population there still prevails a tendency to engage in high-risk sexual behaviors. In fact, even when in general terms the participants from this sample initiated their active sexual life at a mean age of 18.10 years (higher than the age

Table 2
Multiple linear regression analysis of predictors of having sexual relations with multiple partners in the entire sample

Variables	Standard error	β	T	p
Constant	0.818		7.148	<0.001
Biological age	0.031	0.240	2.843	<0.005
Age of first sexual relation	0.043	-0.252	-2.998	<0.005
Motives: opportunity	0.063	0.152	1.842	0.068
Biological state: excitation	0.078	0.188	2.216	<0.05
Biological state: alcohol consumption	0.058	0.255	3.009	<0.005

Table 2a
Results from the ANOVA y values of the Durbin-Watson statistic for the entire sample

Model	Sum of ²	Df	X ²	F	p	Durbin-Watson
Regression	30.099	5	6.020	11.376	<0.001	1.908
Residuals	59.265	112	0.529			
Totals	89.364	117				

Table 3
Multiple linear regression analysis of predictors of having multiple sexual partners for the CESUES sample

Variables	Standard error	β	T	p
Constant	1.893		0.931	0.097
Biological age	0.043	0.406	3.284	<0.005
Age of first sexual relation	0.107	-0.345	-2.655	<0.005
Biological state: excitation	0.121	0.298	2.203	<0.05
Biological state: alcohol consumption	0.924	0.237	1.712	0.098

Table 3a
Results of the ANOVA and values of the Durbin-Watson statistic for the sample from CESUES

Model	Sum of ²	Df	X ²	F	p	Durbin-Watson
Regression	15.323	5	3.831	10.161	<0.001	1.665
Residuals	10.556	28	0.337			
Totals	25.879	32				

reported in other studies that used adolescent and college student samples in the same and other regions of the country)^{13,14}, the fact is that a little less than half had

become sexually involved with more than one partner in a period of two to three years, if the mean biological age and mean age of first sexual relations are considered.

Table 4
Multiple linear regression analysis of predictors of having multiple sexual partners for the UACJ sample

Variables	Standard error	β	T	p
Constant	0.773		5.343	<0.001
Biological age	0.033	-0.190	-1.933	<0.05
Biological state: excitation	0.096	0.214	2.088	<0.05
Biological state: alcohol consumption	0.071	0.301	2.925	<0.005

Table 4a
Results from the ANOVA and values of the Durbin-Watson statistic for the sample from UACJ

Model	Sum of ²	Df	X ²	F	p	Durbin-Watson
Regression	14.763	3	4.921	8.335	<0.001	1.829
Residuals	47.825	81	0.590			
Totals	62.528	84				

This is especially concerning, if both the social circumstances in which students tend to engage in sexual relations with multiple partners, and the influence of the biological states in which they arrive prior to engaging in sexual relations with penetration, are considered. Indeed, it was two types of biological states that, together with biological age and age of first sexual relations, were shown to have a decisive influence in engaging in the above mentioned behavior. Whereas for the participants from CESUES the biological state «I was excited» was a determining factor, for participants from UACJ the determining factors were that same biological state and «I was under the influence of alcohol».

Now then, how should we interpret these findings? While it is true that in various investigations it has been shown that initiating an active sexual life at an early age facilitates the instrumental exercise of different high-risk behaviors¹⁵⁻¹⁷, it must be understood that age of initiation is a variable that by itself does not explain why and under what circumstances people engage or not in high-risk sexual behaviors. In that sense, the role that other variables play should be taken into account, such as the ones considered in the psychological model of prevention used here, for example in terms of motives, social circumstances and biological states.

If in a particular social situation a person wishes to

engage in sexual relations with multiple partners because there are implicit positive consequences –e.g., «perception» of control over the relation or the attainment of sexual gratification or pleasure–, the probability that that person consistently engages in such behavior will be higher, depending both on the social circumstance and on the specific biological conditions of excitation or other conditions that are mediated by the consumption of substances such as alcohol or drugs that are present on any given moment within the interaction¹⁸.

In the case of women from Hermosillo, Sonora, this was evident in the influence of the biological state «I was excited». To the extent that women learn to associate the practice of the behavior in question with positive consequences such as the ones mentioned above, what is occurring is that a propensity to behave in a given way is reinforced in different social situations, with the known risk involved in engaging in sexual relations with partners of whom the sexual history is unknown, which may lead to a difficulty in adopting the relevant preventative measures (e.g., the consistent and efficient use of condoms), all of which has been addressed in other places with samples of both male and female college students from the northwest and central regions of our country^{19,20}.

With regard to women from Ciudad Juárez, the interesting results from the regression analysis were the

predictors of the behavior in question, specifically biological age and two types of biological states. This means that, in contrast with women from Hermosillo, Sonora, women from this sample respond to social situations strictly in circumstantial terms, or in function of the specific biological conditions produced, on the one hand, by a biological state of sexual deprivation, and on the other, by the consumption of alcohol. These are conditions that tend to facilitate the practice of different high-risk sexual behaviors (initiating an active sex life at an early age, having sexual relations with multiple partners and not using a condom consistently and effectively, among others), thereby increasing the probability of an STD, including HIV infection.

In other words, if in a social situation women from the second sample arrive in a state of sexual deprivation or are under the influence of alcohol, the probability that they will become involved with multiple partners will be higher, if in such situation the opportunity to engage in sexual relations presents itself because there is a partner present that is expecting to be sexually satisfied (in the sense of obtaining immediate positive consequences), or because the use of alcohol «uninhibits» them sexually. Whatever is the biological state, there is no doubt that both increase the probability of engaging in high-risk sexual behaviors, limiting a later competent performance, that is, the performance of efficient preventative sexual behaviors.

In summary, the present findings suggest that women from both samples keep engaging in high-risk sexual behaviors that can lead to an STD, and in particular to HIV infection. Since we are dealing with college students, and based on the education level and the promotion of ad campaigns oriented to the prevention of STDs that have been implemented in our country, it would be expected that these samples would engage in preventative sexual behaviors. Therefore, it appears that neither education level nor the above mentioned ad campaigns are determining factors in the practice of these preventative behaviors, but that other variables both past and present, such as the ones studied here, may play a determining role.

From a theoretical point of view and based on the psychological model of prevention that guided the current study, biological states constitute events that modulate or regulate in a negative fashion the exercise of the

behavioral competencies and, therefore, the consistent and efficient practice of preventative sexual behaviors. This is a key aspect in understanding why and under what circumstances people engage in high-risk behaviors, thereby increasing the risk of HIV infection, especially if when becoming involved with multiple partners and under the influence of those biological states the consistent and efficient use of a condom becomes less likely.

In light of this, along with the need to extend our knowledge of the variables that facilitate the practice of high-risk sexual behaviors, it will also be necessary to design intervention programs in the area of sexual health, with the aim of promoting the acquisition and execution of behavioral competencies, that include, among other things and in accordance with Bayes & Ribes⁵:

- a. a recognition of which are the high-risk and preventative sexual behaviors;
- b. knowing how to identify which social situations exemplify signs or conditions of stimuli that facilitate the practice of high-risk behaviors;
- c. knowing how to identify the signs of biological stimuli that also facilitate these behaviors, both in terms of states of sexual deprivation and those related to the use of alcohol and its uninhibiting effects;
- d. a recognition of what are the consequences in the short and longer term that are associated with high-risk sexual behaviors, and
- e. practicing preventative sexual behaviors and learning how to assess their benefits both to oneself and to one's partners, behaviors that previously included negotiating and correct decision-making.

There are two limitations of the current study. On the one hand, even though a representative sample from both institutions was taken, the samples consisted of less than 10% of the total student population from these institutions, so that future studies could include a larger sample, both from these two institutions and from other regions of the country. On the other hand, future studies should include, along with the variables considered in the current study, other variables that make up the model, such as situations linked with stress, particularly those that have to do with a tendency to high-risk behaviors and decision making, mainly.

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