Contents available at **PubMed**
www.anmm.org.mx

PERMANYER

Gac Med Mex. 2015;151:184-91

GACETA MÉDICA DE MÉXICO

ORIGINAL ARTICLE

Alcohol, and tobacco consumption and sports practice in Mexican and Spanish university students and the association between quality of life and health and sensation seeking

*Pedro Ángel Latorre-Román, María Gallego-Rodríguez, José Armando Mejía-Meza and Felipe García-Pinillos**

Musical, Plastic and Corporal Expression Didactics Department, Universidad de Jaén, Spain

Abstract

Objective: *To analyze the alcohol, and tobacco consumption and sports practice for Mexican and Spanish and its relation to sensation seeking.* **Methods:** *309 university students participated, 154 Spanish and 155 Mexican. We used the Sensation Seeking Scale (SSS-V), the health survey Short-Form 36 (SF-36) and a lifestyle questionnaire conducted ad hoc.* **Results:** *Mexican Students often have lower consumption of tobacco, alcohol and binge drinking and more frequent sport than Spanish students and receive higher scores on the SF-36. Disinhibition is a risk factor for alcohol consumption and physical inactivity and SSS-V for tobacco consumption.* **Conclusions:** *The consumption of alcohol, tobacco and physical inactivity in universities in Spain and Mexico is low. The SSS-V full scale is a predictor of tobacco consumption and dimension DES of alcohol consumption and physical inactivity.* (Gac Med Mex. 2015;151:184-91)

Corresponding author: *Felipe García Pinillos, fegarpi@gmail.com*

KEY WORDS: *Lifestyle. Health. University. Sensation seeking. Quality of life.*

Introduction

Combined consumption of alcohol and tobacco and physical inactivity in adolescents is a public health problem that continues into adult age and that brings together negative consequences for health[1,2], including high levels of preventable morbidity and mortality[3]. Tobacco and alcohol consumption is an important populational health problem both in Spain[4] and in Mexico[5].

In Mexico, alcohol is the most widely used substance among young adults and it significantly contributes to the most common causes of mortality and morbidity (e.g., accidents, violence, homicides, suicides and risky behaviors)[6]. In Spain, although alcohol global consumption has decreased, an increase in its consumption has been occurring since a few years in the form of drunkenness or alcohol consumption in a few concentrated hours in recreational spaces on weekends to reach a certain level of drunkenness, which is known as "binge dinking"[7].

Correspondence:
*Felipe García Pinillos
Departamento de Didáctica de la Expresión Musical Plástica y Corporal
Universidad de Jaén Campus de Las Lagunillas, s/n
Edificio D2, despacho 142
C.P. 23008, Jaén, España
E-mail: fegarpi@gmail.com

Date of modified version reception: 25-01-2014
Date of acceptance: 16-04-2014

The practice of physical activity has been considered an alternative to prevent unhealthy lifestyle habits. However, this belief that the engagement in sports activities limits the consumption of substances such as alcohol is not very clear, since many young sports practicing men/women show similar or heavier consumption patterns than their sedentary peers[8,9]. With regard to tobacco, some authors[10] maintain that active adolescents refer lower consumption and that there is a trend towards smoking less and even not to do it by physically active subjects. Sports competition exerts an indirect influence oh healthy behaviors, since the higher the perception of sports competition, the higher the practice of sports, the less the tobacco and alcohol consumption and the higher the intake of healthy foods[11].

The search for sensations has been widely studied in the research of individual differences with regard to risk taking propensity in a wide range of behaviors such as risky driving, unintentional injuries, consumption of alcohol, tobacco and illegal drugs, bad eating habits and physical inactivity, practice of risky sports, sexual behaviors, delinquency and other antisocial behaviors and recreational habits[12-14]. Zuckerman (1979)[15] considers that sensation-seeking involves a need to experience varied and complex sensations and the willingness to take physical and social risks for the simple desire to enjoy such experiences. Males experience more sensation-seeking than females, which may de due to both biological factors and socialization. With regard to age, there appears to be a negative relationship between age and sensation seeking[16]. Sensation seeking is associated with a number of biological correlations, including neurotransmitters, enzymes and hormones[16] and individual variation can be inheritable[17]. Sensation seeking is a strong correlate of alcohol and tobacco consumption among youths[18,19]. In adolescents, consumers of adictive substances such as tobacco, alcohol and marihuana score higher in sensation seeking than non-consumers[20]. In turn, the search for emotions and sensations stands out among sportsmen/women that practice risky sports[21].

A better understanding of the relationships between health and risky behaviors, as well as certain personality factors that promote them, may help in the development of health-promotion interventions for several types of young adults.

The purpose of this study is to analyze alcohol and tobacco consumption-related lifestyle habits and the practice of sports in Mexican and Spanish college students and their relationship with health-related quality of life and sensation seeking.

Materials and methods

Participants

A total of 309 subjects participated, 159 of Spanish nationality (age: 20.91 ± 1.55 years; 69 males and 85 females; students of the teaching career at the Universidad de Jaén) and 155 of Mexican nationality (age: 21.05 ± 2.52 years; 70 males and 85 females; students of the Escuela Superior de Educación Física, the Escuela Nacional para Maestras de Jardines de Niños and the Escuela de Iniciación Artística Nº 4 de Bellas Artes in Mexico, D.F.). A non-probabilistic sampling (for convenience reasons) through voluntary participation of students enrolled in the above mentioned colleges. As inclusion critera, the subjects had to be currently engaged in college studies and be younger than 25 years of age. As exclusion criteria, subjects were required not to suffer from any cognitive or sensory disability or have a diagnosis of alcohol, tobacco or other drugs dependence.

Materials

The Spanish-language version of the Sensation Seeking Scale (SSS-V) was employed[22,23]. This scale is comprised by 40 items and subdivided in four 10-item subscales: thrill and adventure seeking (TAS), experience seeking (ES), disinhibition (Dis) and boredom susceptibility (BS). There is also a total score. Zuckerman et al. (1978)[22] indicate reliability coefficients (Cronbach's α) for total score within a range of 0.83 to 0.86, and partial reliabilities for the other 4 subscales ranging from 0.56 to 0.82. In the Spanish sample, the instrument shows total scale reliability coefficients of 0.78 and 0.80 for males and females, respectively, and for each scale, from 0.74 to 0.50 in males and from 0.68 to 0.51 in females[24].

The Health Survey Short Form-36 (SF-36) was employed to measure health-related quality of life. In this study, the Spanish-language version of the SF-36 was used[25]. It is an instrument to assess health-related quality of life. It comprises 36 items grouped in 8 dimensions: physical functioning (PF), physical role (PR), bodily pain (BP), general health (GH), vitality (VIT), social functioning (SF), emotional role (ER) and mental health (MH). Scores range from 0 to 100 for each dimension; highest scores indicate better health. A Cronbach α coefficient within an interval of 0.84-0.56 was obtained in the Mexican population[26] and of 0.96-0.78 in the Spanish population[27].

Table 1. Frequency of alcoholic beverages consumption and binge drinking by country

		Country		p-value*
		Spain n (%)	Mexico n (%)	
Frequency of alcoholic beverages consumption	Daily	6 (3.9)	0 (0)	p < 0.001
	Weekly	66 (42.9)	23 (14.8)	
	Monthly	34 (22.1)	20 (12.9)	
	Rarely	45 (29.2)	105 (67.7)	
	Never	3 (1.9)	7 (4.5)	
Frequency of binge drinking	Never	32 (20.8)	52 (33.5)	P < 0.001
	Once	22 (14.3)	39 (25.2)	
	2-3 times	40 (26.0)	40 (25.8)	
	4-10 times	21 (13.6)	10 (6.5)	
	More than 10 times	39 (25.3)	14 (9.0)	

*Pearson's χ^2 test.

For the analysis of life habits, an adaptation of the Health Behavior in School-aged Children questionnaire was used[28], where aspects on alcohol consumption (yes/no) and frequency (never, rarely, monthly, weekly, daily), as well as the frequency of binge drinking (never, once, 2-3 times, 4-10 times, more than 10 times) were collected. Aspects associated with tobacco consumption (yes/no) and frequency (never, every day, several times per week but not every day, less than once weekly) were also collected, as well as sports practice (yes/no) and frequency (every day, 4-6 times per week, 2-3 times per week, once weekly, once monthly, less than once monthly, never), establishing as the cutoff point for the student who practiced sports to be considered sportsman/woman a minimum of 3 times weekly. Additionally, the hours of weekly sport practice were also recorded.

Procedure

An interview was conducted with the vice deans of each school to expose the purposes of the research and ask for their collaboration. Then, class groups were approached to ask for voluntary collaboration in the study and for their informed consent. The surveys were completed by the students in their classrooms, anonymously and with the presence of an investigator to solve their doubts. The study was conducted in compliance with the regulations of the Declaration of Helsinki (2008 version) and following the European Union guidelines for Good Clinical Practice (111/3976/88 from July 1990), as well as the Spanish legal framework for clinical research in human beings (Royal Decree 561/1993 on clinical trials). The study was approved by the Ethics Committee of the Master on Research and Teaching in Sciences of Physical Activity and Health of the Universidad de Jaén. Data collection was performed between April and May 2012.

Statistical analysis

Data were analyzed with the statistical program SPSS v. 19.0 for Windows (SPSS Inc., Chicago, USA), and the level of significance was established at $p < 0.05$. Data were presented in descriptive measures such as means, standard deviations (SD) and percentages. Pearsons' chi-square test was used to analyze qualitative variables between groups, and Student's t-test was used for continuous variables. Binary logistic regression was performed with the SSS-V scale as a predictor of smoking, drinking and not practicing sports habits. The predictive efficacy of each lifestyle habit was established by means of receiver operating characteristics (ROC) curves. Finally, Pearson and Spearman correlations were made.

Results

The results for alcoholic beverages consumption frequency are shown in table 1. Significant differences

Table 2. Frequency of tobacco consumption by country

		Country		p-value*
		Spain n (%)	Mexico n (%)	
Frequency of tobacco consumption	Every day	22 (14.3)	9 (5.8)	p < 0.001
	Several times a week, but not every day	9 (5.9)	17 (11.0)	
	Less than once a week	5 (3.3)	22 (14.2)	
	Non-smoker	117 (76.5)	107 (69.0)	

*Pearson's χ^2 test.

are found in the frequency of alcohol consumption ($p < 0.001$) and binge drinking ($p < 0.001$) between countries of origin. Higher alcohol consumption and binge drinking stand out among Spanish students.

We found significant differences in daily consumption of cigarettes ($p < 0.001$; Student's t-test) between Spanish (7.98 ± 28.73) and Mexican students (1.53 ± 5.52). The frequency of tobacco consumption by country is shown in table 2. Significant differences ($p < 0.001$; Pearson's chi-square test) are found in the frequency of tobacco consumption between countries of origin: there is a higher percentage of non-smoking Spanish students, although those who smoke in a higher percentage than Mexican students do it every day.

No significant differences were found in the number of hours of weekly sports practice ($p \geq 0.05$; Student's t-test) between Spanish (3.41 ± 1.53) and Mexican students (3.60 ± 1.18). With regard to the frequency of sports practice (Table 3), there are significant differences ($p = 0.002$) between countries: there is a higher percentage of Spanish students that do not practice sports and, in turn, a lower percentage within those who do it every day. No differences are found in the type of practiced sport ($p \geq 0.05$; Pearson's chi-square test) by country of origin; recreational sports practice is the most predominant in college students from both countries.

Table 4 shows the frequency distribution of tobacco and alcohol consumption between all college students who practice and don't paractice sports; no significant differences are observed ($p \geq 0.05$; Pearson's chi-square test). There are also no significant differences ($p \geq 0.05$) in daily consumption of cigarettes between students engaged in sports (4.93 ± 23.65) and those who aren't (4.30 ± 12.86; Student's t-test).

The results on the SSS-V scale and the SF-36 (Student's t) are shown in table 5. Mexican students show higher ES scores than Spanish students, but lower DIS, BS and total SSS-V scores, with significant differences ($p < 0.05$). In turn, PF, VIT, MH, SF and GH scores were higher in Spanish students ($p < 0.05$).

Table 3. Frequency and type of sports practiced by country

		Country		p-value*
		Spain n (%)	Mexico n (%)	
Sports during leisure time	Every day	20 (13.1)	39 (25.2)	0.002
	4-6 times weekly	32 (20.9)	41 (26.5)	
	2-3 times weekly	39 (25.5)	40 (25.8)	
	Once weekly	28 (18.3)	15 (9.7)	
	Once monthly	9 (5.9)	10 (6.5)	
	Less than once monthly	14 (9.2)	9 (5.8)	
	Never	11 (7.1)	1 (0.6)	
Type of sport	Federation associated	16 (10.4)	29 (18.7)	NS
	Competitive, non-federation-associated	28 (18.2)	25 (16.1)	
	Recreational	110 (71.4)	101 (65.2)	

NS: non-significant.
*Pearson's χ^2 test.

Table 4. Frequency of tobacco and alcohol consumption between students engaged with sports and those who aren't

		Engaged with sports		p-value*
		Yes n (%)	No n (%)	
Frequency of tobacco consumption	Every day	17 (8.0)	14 (14.5)	NS
	Several times a week, but not every day	20 (9.4)	6 (6.3)	
	Less than once a week	20 (9.4)	7 (7.3)	
	Non-smoker	155 (73.1)	69 (71.9)	
Frequency of alcohol consumption	Daily	4 (1.9)	2 (2.1)	NS
	Weekly	63 (29.7)	26 (26.8)	
	Monthly	34 (16.0)	20 (20.6)	
	Rarely	94 (44.3)	41 (42.3)	
	Never	17 (8.0)	8 (8.2)	

NS: non-significant ($p \geq 0.05$).
*Pearson's χ^2 test.

The correlation analysis shows a large number of significant but weak correlations between different variables. In the entire sample, the frequency of tobacco consumption is correlated with the frequency of alcohol consumption ($r = 0.244$; $p < 0.001$). The number of weekly-consumed cigarettes and the hours of sport practiced per week are significantly correlated ($r = 0.155$; $p = 0.06$ and $r = 0.146$; $p = 0.010$, respectively) with SSS-V total score. TAS correlates significantly with weekly hours of sport ($r = 0.227$; $p < 0.001$); ES, with the frequency of tobacco consumption ($r = 0.165$; $p = 0.004$), and DIS, with the number of weekly-consumed cigarettes ($r = 0.193$; $p = 0.001$), frequency of alcohol consumption ($r = 0.417$; $p < 0.001$), frequency of

Table 5. Results in the SSS-V and SF-36 scales by country

	Country		
	Spain Mean (SD)	Mexico Mean (SD)	p-value*
TAS	5.95 (2.65)	6.14 (2.46)	NS
ES	5.59 (1.77)	6.08 (1.58)	0.010
DIS	4.77 (2.08)	3.58 (2.02)	< 0.001
BS	4.01 (2.29)	3.14 (2.07)	< 0.001
Total SSS-V	20.33 (6.25)	18.94 (5.29)	0.03
PF	97.19 (6.36)	94.44 (10.66)	0.006
PR	93.18 (20.26)	94.35 (17.91)	NS
ER	73.59 (38.61)	76.12 (35.58)	NS
VIT	61.09 (21.39)	26.74 (14.84)	< 0.001
MH	60.98 (24.70)	22.14 (14.95)	< 0.001
SF	80.03 (20.58)	52.01 (13.01)	< 0.001
BP†	77.58 (19.62)	80.66 (21.13)	NS
GH	61.26 (23.07)	25.74 (18.22)	< 0.001

NS: non-significant; SD: standard deviation.
*Student's χ^2 test.
†Higher scores imply less pain.

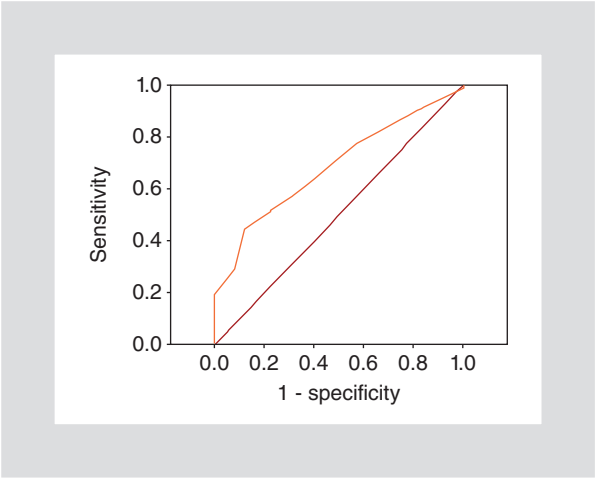

Figure 1. *ROC curve for the alcohol-drinking habit as predicted by DIS.*

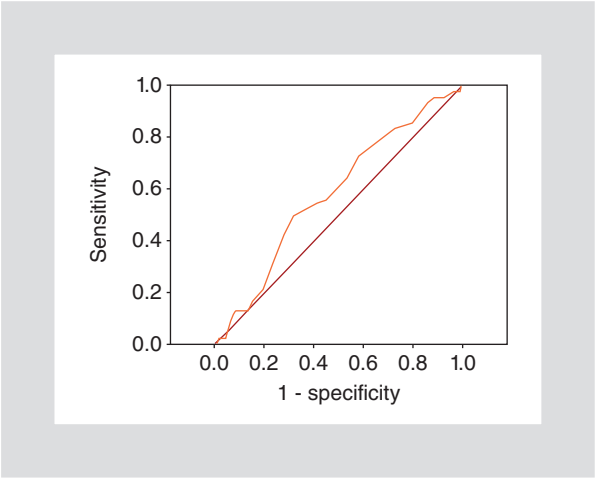

Figure 2. *ROC curve for the tobacco-consumption habit as predicted by SSS-V total score.*

tobacco consumption (r = 0.135; p = 0.018) and the frequency of binge drinking (r = 0.463; p < 0.001). BS is correlated with the frequency of alcohol consumption (r = 0.120; p = 0.035), with that of tobacco consumption (r = 0.117; p = 0.040) and with the frequency of binge drinking (r = 0.174; p = 0.002). SSS-V total score correlates with weekly consumption of tobacco (r = 0.142; p = 0.013), frequency of alcohol consumption (r = 0.197; p = 0.001), frequency of tobacco consumption (r = 159; p < 0.001), frecuency of binge drinking (r = 0.278; p < 0.001) and weekly hours engaged with sports (r = 0.165; p = 0.004). Additionally, in the SF-36 scale, the hours of practiced sport are correlated with PF (r = 0.258; p < 0.01) and ER (r = 0.174; p < 0.01).

In the logistic regression analysis for the alcohol-drinking habit, DIS (odds ratio [OR]: 1.415; 95% confidence interval [CI]: 1.125-1.781; p = 0.003) is a risk factor. In the tobacco-consumption habit, SSS-V total score is a risk factor (OR: 1.048; 95% CI: 1.001-1.097; p = 0.047). In the case of the habit of not practicing sports, DIS is a risk factor (OR: 0.880; 95% CI: 0.800-0.967; p = 0.008).

Figure 1 shows the ROC curve for the habit of drinking alcohol as predicted by DIS (area under the curve [AUC]: 0.686; 95% CI: 0.595-0.777; p = 0.002) indicating weak predictive value; the cutoff point is located at 4.50 (sensitivity: 0.444; 1-specificity: 0.120). Finally, with regard to the tobacco-consumption habit, figure 2 shows the ROC curve for SSS-V total score (AUC: 0.583; 95% CI: 0.513-0.653; p = 0.025) which yields, similarly, weak discrimination power; the cutoff point is located at 1.95 (sensitivity: 0.560; 1-specificity: 0.449).

Discussion

The most relevant finding in this study is that Mexican students show healthier lifestyles associated with the consumption of tobacco and alcohol and the practice of sports than Spanish students, who consume alcohol more frequently, engage more frequently in binge drinking, consume more tobacco and are more sedentary. Thes results are consistent with a study by Ruiz-Ruiseño et al. (2012)[29], where a higher prevalence is demonstrated among Spanish students relative to Mexican students when it comes to the consumption of addictive substances such as tobacco and alcohol and, therefore, Mexican students exhibit healthier behaviors.

Paradoxically, Spanish students score higher in the PF, VIT, MH, SF and GH dimensions of the SF-36 scale, which contradicts the findings by Lorente et al. (2004)[9], who associated bad perception of health with alcohol and tobacco consumption. It is possible that other socioeconomic-natured factors, not controlled in this study, may have influenced on these results. The SSS-V scale and its different dimensions are significantly, athough weakly, correlated with alcohol and tobacco consumption habits and, in turn, DIS and SSS-V total score are risk factors and predictors of alcohol and tobacco consumption, respectively, in students from both countries, although with weak predictive power.

Prevalence of non-drinkers and alcohol daily consumption is very low among students of each country. We also emphasize that the prevalence of students that never have gotten drunk is higher among Mexican

students than in their Spanish peers (33.5% vs. 20.8%), with results being lower than those reported by Jiménez Muro-Franco et al. (2009)[30], which indicate that 66.2% of college students have gotten drunk sometime in their lives. Molina et al. (2012)[31] also report a high prevalence of alcohol consumption among Spanish college students (78.3%) and Trujillo-Hernández et al. (2010)[32] report 64.5% among Mexican students. The higher frequency of drunkenness among Spanish students in this study may be related to the weekend heavy drinking custom in what is known as "binge drinking". Data on alcohol consumption by Mexican college students in this study are not consistent with the consumption style indicated by other authors[33,34], which is characterized by low frequency but in large amounts and with a marked trend towards drunkenness.

There are significant diferences found in the prevalence of smoking: 23.5% in Spaniards and 31% in Mexicans, which is considerably lower than findings from other studies[31,35], which report a prevalence of 31.7% and 28.2%, respectively, among Spanish college students. With regard to Mexican college students, these results are higher than those reported by Trujillo-Hernández et al. (2010)[32] (23.1%). However, although smoking prevalence is higher in Mexican students, daily cigarette consumption is significantly lower than in Spanish students. Data on daily cigarette consumption by Spanish students in this study are lower than those provided by Jiménez Muro-Franco et al. (2009)[30] (12 ± 5.76). The low prevalence of smoking and physical inactivity can also be considered to be attributable to the fact that this study was conducted with a sample of college students. In this sense, the presence of low income[36] and low levels of education[37] are predisposing factors for the consumption of tobacco and physical inactivity, respectively.

Smoking, alcohol consumption and the practice of physical activity are behaviors that appear to be inversely related[29,38], but this relationship is often attenuated in adolescents and men who practice more sports o more vigorous exercise[1,39,40], although the context of the practice and type of the practiced sport should be taken into consideration to examine the realtionship between engagement in sports and alcohol consumption[1,41]. On the other hand, it appears that students who smoke practice less sport[30]. In this sense, VanKim et al. (2010)[42] report that elevated levels of moderate and vigorous physical activity are associated with higher levels of alcohol consumption and lower levels of smoking. Kaczynsky et al. (2008)[39] indicate that the relationship between tobacco consumption and physical activity might be decreased in youths. Rodríguez et al. (2010)[40] report higher rates of sedentarism during leasure time among smokers. There are also other works that have not indicated the relationship, for example, between smoking and physiscal activity[43], as in this study.

The lack of association between physical inactivity and alcohol and tobacco consumption found in this study may be associated with a low daily intake.

The sensation seeking scale total score and its dimensions correlate significantly, although weakly, with the lifestyle habits described in the study and, in turn, Spanish students show higher alcohol and tobacco consumption and higher DIS, BS and total SSS-V scores. These results confirm what Martin et al. (2002)[44] indicated: sensation-seeking is greater in subjects who consume nicotine and alcohol. Other authors[45] also highlight higher sensation-seeking scores in youths who are illegal drug users. SSS-V total score is a predictor of tobacco consumption and the DIS dimension of this scale predicts alcohol consumption and physical inactivity. Sargent et al. (2010)[46] show that sensation seeking is a predictor of excessive alcohol consumption both in male (AUC: 0.72; 95% CI: 0.69-0.74) and female adolescents (AUC: 0.70; 95% CI: 0.68-0.73) and of tobacco consumption both in men (AUC: 0.78; 95% CI: 0.74-0.83) and women (AUC: 0.81; 95% CI: 0.75-0.86).

Conclusions

Alcohol and tobacco daily consumption and prevalence of physical/sports activity in college students from Spain and Mexico are low, and the frequency of these habits is higher among Spanish college students. SSS-V total score is a predictor of tobacco consumption and the DIS dimension of this scale predicts alcohol consumption and physical inactivity; both these factors are higher in Spanish students. There is no association between alcohol and tobacco consumption and the practice of sports.

References

1. Johnson CC, Webber LS, Myers L, Boris NW, Berenson GS. Co-use of alcohol and tobacco among ninth-graders in Louisiana. Prev Chronic Dis. 2009;6(3):A85.
2. World Health Organization. Preventing chronic diseases: a vital investment. [Internet] Consultado el 25 de enero de 2013. Disponible en: www.who.int/chp/chronicdiseasereport/en/.
3. King A, Wold B, Tudor-Smith C, Harel Y. The health of youth. A cross-national survey. Copenague: Who Regional office for Europe; 1996.
4. Ministerio de Sanidad y Política Social. Informe 2009 del Observatorio Español sobre drogas. Situación y tendencias de los problemas de drogas en España. Madrid: Delegación del Gobierno para el Plan Nacional sobre Drogas; 2009.

5. Secretaría de Salud (MX). Encuesta Nacional de Adicciones (ENA-2008) México, D.F: Dirección General de Epidemiología/Instituto Mexicano de Psiquiatría; 2008.
6. Díaz A, Díaz R, Hernández C, Narro J, Fernández H, Solís C. Prevalencia del consumo riesgoso y dañino de alcohol y factores de riesgo en estudiantes universitarios de primer ingreso. Salud Mental. 2008; 31:271-82.
7. Calafat A. [Alcohol abuse by young people in Spain]. Adicciones. 2007; 19(3):217-24.
8. Ruiz-Juan F, Ruiz-Risueño J. Variables predictoras de consumo de alcohol entre adolescentes españoles. Anales de Psicolog. 2011;27(2): 350-9.
9. Lorente FO, Souville M, Griffet J, Grélot L. Participation in sports and alcohol consumption among French adolescents. Addict Behav. 2004; 29(5):941-6.
10. Tercedor P, Martín-Matillas P, Chillón LJ, et al. [Increase in cigarette smoking and decrease in the level of physical activity among Spanish adolescentes. AVENA study]. Nutr Hosp. 2007;22(1):89-94.
11. Pastor Y, Balaguer I, García-Merita M. [The relationship between self-concept and a healthy lifestyle in adolescence: an exploratory model]. Psicothema. 2006;18(1):18-24.
12. Bovard RS. Risk behaviors in high school and college sport. Current Sports Med Rep. 2008;7(6):359-66.
13. Dunlop SM, Romer D. Adolescent and young adult crash risk: sensation seeking, substance use propensity and substance use behaviors. J Adolesc Health. 2010;46(1):90-2.
14. Zuckerman M. Sensation seeking and risky behavior. Washington, D.C.: Am Psychol Assoc; 2007.
15. Zuckerman M. Sensation Seeking: Beyond the Optimal Level of Arousal. Hillsdale, NJ: Erlbaum; 1979.
16. Roberti JW, Storch EA, Bravata E. Sensation seeking, exposure to psychosocial stressors, and body modifications. Pers Indiv Differ. 2004;37(6):1167-77.
17. Stoel RD, De Geus EJC, Boomsma DI. Genetic Analysis of Sensation Seeking with an Extended Twin Design. Behav Genetics. 2006;36(2): 229-37.
18. Gullo MJ, Dawe S. Impulsivity and adolescent substance use: Rashly dismissed as «all-bad»? Neurosci Biobehav Rev. 2008;32(8):1507-18.
19. Urban R. Smoking outcome expectancies mediate the association between sensation seeking, peer smoking, and smoking among young adolescents. Nicotine Tob Res. 2010;12(1):59-68.
20. Crawford A, Pentz M, Chou C, Li C, Dwyer J. Parallel developmental trajectories of sensation seeking and regular substance use in adolescents. Psych Addict Behav. 2003;17(3):179-92.
21. Guszkowska M, Boldak A. Sensation seeking in males involved in recreational high risk sports. Biology of Sport. 2010;27(3):157-62.
22. Zuckerman M, Eysenck S, Eysenck HJ. Sensation seeking in England and America: Cross-cultural, age, and sex comparisons. J Consult Clin Psychol. 1978;46(1):139-49.
23. Pérez J, Torrubia R. Fiabilidad y validez de la versión española de la Escala de Búsqueda de Sensaciones (Forma V). Rev Latinoam Psicolog. 1986;18(1):7-22.
24. Chico L. Búsqueda de sensaciones. Psicothema. 2000;12(2):229-35.
25. Alonso J, Prieto L, Anto JM. The Spanish version of the SF-36 Health Survey (the SF-36 health questionnaire): An instrument for measuring clinical results. Med Clin. 1995;104(20):771-6.
26. Zúniga M, Carrillo-Jiménez G, Fos P, Gandek B, Medina-Moreno M. [Evaluation of health status using Survey SF-36: preliminary results in Mexico]. Salud Publica Mex, 1999;41(2):110-8.
27. Alonso J, Regidor E, Barrio G, Prieto L, Rodríguez C, De La Fuente L. [Population reference values of the Spanish version of the Health Questionnaire SF-36]. Med Clin (Barc). 1998;111(11):410-6.
28. Currie C. Health Behaviour in School-Aged Children. Research protocol for the 1997–98 survey. A World Health Organization Cross-National Study. Edimburgo: University of Edinburgh; 1998.
29. Ruiz-Risueno J, Ruiz-Juan F, Zamarripa JI. Alcohol and tobacco consumption in Spanish and Mexican adolescents and its relation to physical and sports-related activity and to the family. Rev Panam Salud Publica. 2012;31(3):211-20.
30. Jiménez-Muro Franco A, Beamonte San Agustín A, Marqueta A, Gargallo Valero P, Nerín de la Puerta I. [Addictive substance use among first-year university students]. Adicciones. 2009;21(1):21-8.
31. Molina A, Verónica V, Fernández T, Martín V, Ayán C, Cancela JM. Unhealthy habits and practice of physical activity in Spanish college students: the role of gender, academic profile and living situation. Adicciones. 2012; 24(4):319-28.
32. Trujillo-Hernández B, Vásquez C, Almanza-Silva JR, et al. [The frequency of risk factors associated with obesity and being overweight in university students from Colima, Mexico]. Rev Salud Pub. 2010;12(2): 197-207.
33. Puig-Nolasco A1, Cortaza-Ramirez L, Pillon SC. [Alcohol use among Mexican medical students]. Rev Latino Am Enfermagem. 2011;19 (7): 14-21.
34. Herrera-Vázquez M, Wagner FA, Velasco-Mondragón E, Borges G, Lazcano-Ponce E. [Onset of alcohol and tobacco use and transition to other drug use among students from Morelos, Mexico]. Salud Pub Mex. 2004;46(2):132-40.
35. Ministerio de Sanidad y Consumo. Encuesta Nacional de Salud de 2006. Madrid: Instituto Nacional de Estadística; 2007.
36. Malcon MC, Menezes AMB, Chatkin M. [Prevalence and risk factors for smoking among adolescents]. Rev Saude Publica. 2003;37(1):1-7.
37. Varo JJ, Martínez-González MA, De Irala-Estévez J, Kearney J, Gibney M, Martínez JA. Distribution and determinants of sedentary lifestyles in the European Union. Int J Epidemiol. 2003;32(1):138-46.
38. Ruiz-Juan F, Cruz E, Garcia ME. Motivos para la práctica deportiva y su relación con el consumo de alcohol y tabaco en jóvenes españoles. Salud Pub Mex. 2009;51(6):496-504.
39. Kaczynski A, Manske S, Mannell R, Grewal K. Smoking and physical activity: a systematic review. Am J Health Behav. 2008;32(1):93-110.
40. Rodríguez G, García O, Garrido M, Barriopedro M, Barakat R, Cordente C. Relaciones entre el consumo de tabaco y la práctica de actividad físico-deportiva en una muestra de la población de Madrid. Int J Sport Science. 2010;6(20):218-30.
41. Martha C, Grélot L, Peretti PW. Participants' sports characteristics related to heavy episodic drinking among French students. Int J Drug Policy. 2009;20(2):152-60.
42. VanKim NA, Laska MN, Ehlinger E, Lust K, Story M. Understanding young adult physical activity, alcohol and tobacco use in community colleges and 4-year post-secondary institutions: A cross-sectional analysis of epidemiological surveillance data. BMC Public Health. 2010; 10:208.
43. Rodrigues ES, Cheik NC, Mayer AF. [Level of physical activity and smoking in undergraduate students]. Rev Saude Publica. 2008;42(4): 672-8.
44. Martin CA, Kelly TH, Rayens MK, et al. Sensation seeking, puberty, and nicotine, alcohol, and marijuana use in adolescence. J Am Acad Child Adolesc Psychiatry. 2002;41(12):1495-502.
45. Sáiz PA, González MP, Jiménez L, et al. Consumo de alcohol, tabaco y otras drogas y rasgos de personalidad en jóvenes de enseñanza secundaria. Adicciones. 1999;11(3):209-20.
46. Sargent JD, Tanski S, Stoolmiller M, Hanewinkel R. Using sensation seeking to target adolescents for substance use interventions. Addiction. 2010;105(3):506-14.