

# Tobacco and alcohol use in adolescents with unplanned pregnancies: relation with family structure, tobacco and alcohol use at home and by friends.

Vazquez-Nava Francisco<sup>1</sup>, Vazquez-Rodríguez Carlos<sup>2</sup>, Vazquez-Rodríguez Eliza<sup>3</sup>,  
Castillo-Ruiz Octelina<sup>4</sup>, Iribar Ibabe Maria<sup>5</sup>

1. Autonomus University of Tamaulipas, Faculty of Medicine of Tamaulipas
2. Social Security Mexican Institute, Shout of Veracruz Delegation
3. Veracruzana University, Faculty of Medicine, Mexico
4. Autonomus University of Tamaulipas, Unidad Académica Multidisciplinaria Reynosa Aztlán, Mexico
5. University of Granada, Faculty of Medicine

## Abstract:

**Background:** Recent publications show that smoking and alcohol use among adolescents with unplanned pregnancy is increasing and the causes need to be further studied.

**Objective:** To determine the association between living in a non-intact family household and the presence of smokers and consumers of alcoholic beverages in the adolescents' environment with smoking and consuming alcoholic beverages in adolescents with unplanned pregnancies.

**Methods:** A cross-sectional study was carried out among 785 pregnant adolescents, aged 13-19 years. Data was collected by trained interviewers using a self-administered questionnaire. The association was determined using multivariate logistic regression analysis.

**Results:** In adolescents with unplanned pregnancies, the prevalence of active smoking was 21.2% and of alcohol consumption, 41.5%. The percentage of smoking at home was 57.4% and alcohol consumption, 77.5%. Approximately, 80.3% of adolescents with unplanned pregnancies had friends who smoked and 90.6% consumed alcoholic beverages. Multivariate logistic regression analysis shows that having friends who smoke or who consume alcoholic beverages is the most important risk factor for substance use in adolescents with unplanned pregnancies. Smoking and alcohol consumption at home are not associated with smoking in adolescents with unplanned pregnancies.

**Conclusion:** Socializing with friends who smoke and/or consume alcoholic beverages constitutes the most important risk factor for substance use among adolescents with unplanned pregnancies.

**Key words:** Family, unplanned pregnancy, substance use, adolescents.

**DOI:** <http://dx.doi.org/10.4314/ahs.v16i1.4>

**Cite as:** Francisco V-N, Carlos V-R, Eliza V-R, Octelina C-R, Maria I. Tobacco and alcohol use in adolescents with unplanned pregnancies: relation with family structure, tobacco and alcohol use at home and by friends. *Afri Health Sci.* 2016;16(1): 27-35. <http://dx.doi.org/10.4314/ahs.v16i1.4>

## Introduction

Smoking and consumption of alcoholic beverages constitute an important health problem worldwide and have been related with a great number of negative effects, including laryngeal carcinoma, cirrhosis of the liver, chronic pancreatitis and development of health-risk behaviors such as sexual activity at an early age, and unplanned pregnancies in adolescents.<sup>1-6</sup>

According to the World Health Organization, in many developed and developing countries, a great number of pregnancies in adolescents is reported every year, of which up to 80% are unplanned.<sup>7-12</sup> The negative effects induced by unplanned pregnancies include an increase in maternal-infantile morbidity and mortality, loss of self-esteem, depression, anxiety, familial conflicts, dropping out of school, interruption of life projects, premature incorporation into the labor force, and maintenance of the poverty cycle.<sup>6,7,8,9</sup> Even more, pregnant teens tend to recognize their pregnancies later than adult women and are more likely to be engaged in binge drinking and drug use early in their pregnancies, thus exposing the fetus to alcohol.<sup>13,14,15,16</sup>

### Corresponding author:

Vazquez-Nava Francisco,  
Autonomus University of Tamaulipas,  
Faculty of Medicine of Tamaulipas  
Email: [fvazqueznav@gmail.com](mailto:fvazqueznav@gmail.com),  
[fvazqueznav@yahoo.com.mx](mailto:fvazqueznav@yahoo.com.mx)

There is evidence showing that smoking and consuming alcoholic beverages are associated with the development of unplanned pregnancies.<sup>17,18</sup> Recent studies show that, the prevalence of smoking and alcohol consumption, is higher in adolescents who develop unplanned pregnancies and the causes that lead these young people to use these types of substances are unclear.<sup>1,2</sup>

Several theories have been examined in an attempt to identify the factors that influence smoking behavior and alcohol use in adolescents; no consensus has been reached.<sup>19,20</sup> One significant proposal is that the absence of one or both biological parents (non-intact family), or the presence of parents and friends who smoke and consume alcohol within the adolescents' environment can be responsible for the development of smoking and consumption of alcoholic beverages.<sup>21,22,23,24</sup> However, to our knowledge, the association between family structure, tobacco and alcohol use at home and by friends, with smoking and alcohol use in adolescents with unplanned pregnancies has not been studied.

It is clear that living in a non-intact family household and the presence of smokers and consumers of alcohol in the adolescents' environment can exert different effects on the development of their behavior, possibly favoring the acquisition of certain habits or risky behaviors, particularly smoking and consumption of alcoholic beverages.<sup>19,20,24,25</sup>

One priority for the control of smoking and alcohol use is to identify, but above all to understand, the degree to which some familial and social circumstances influence the development of certain health-risk habits and behaviors in adolescents with unplanned pregnancies. Accordingly, this study was designed to determine the association between living in a non-intact family household and the presence of smokers and consumers of alcoholic beverages in the adolescents' environment with smoking and consuming alcoholic beverages in adolescents with unplanned pregnancy.

## Methods

### Design, participants, and setting

We conducted a cross-sectional study based on a population research. A total of 3,500 female adolescents aged 13–19 years who had participated in a prior, broader study with the primary objective of detecting and preventing health-risk habits and behaviors, were invited

to participate in the present study.<sup>26</sup> Of these, 370 adolescents were excluded in the final sample due to not completing the questionnaire or reporting incorrect information that impeded its analysis. Thus, we analyzed data on 3,130 adolescents. From these, 785 (25%), were pregnant.

The selection criteria for this study was: adolescents, aged 13 – 19 years, that were pregnant and without disease. The sample corresponds approximately to 35% of the total population of female adolescents in our region. Data was analyzed in 2013.

The female adolescents included in the study were residents of an urban area of North-Eastern Mexico. This zone is localized in the southern part of the State of Tamaulipas, on the Gulf of Mexico coast and 542 km North-West of the Mexican capital, and is composed of the cities of Tampico, Madero, and Altamira. The three cities share an area of 1,492.7 km<sup>2</sup> and have a population of 706,771 inhabitants.

The study was approved by the Ethics Committee of the Faculty of Medicine of Tampico of the Autonomous University of Tamaulipas.

### Procedure

For data collection, we constructed a self-administered questionnaire based on others previously utilized.<sup>27,28</sup> Questionnaire completion was carried out with specially trained personnel. Training of personnel was conducted through presentations and workshops with the objective of unifying criteria with regard to certain questionnaire items, including those related with the diagnosis of health-risk habits and behaviors such as unplanned pregnancy.

Those adolescents meeting the inclusion criteria were invited to participate in the study. The trained personnel in research studies contacted all patients and provided a verbal explanation of study. These personnel were available on site during the application of the questionnaire and provided additional information when necessary. The adolescents were informed that their participation was voluntary, they would remain anonymous, and all information would be kept confidential. All the participants provided written informed consent prior to the survey. Adolescents had the right to withdraw from the study at any time without penalty, even after they had finished responding to the questionnaire. The time

required to complete the questionnaire was approximately 30 minutes. A total of 89.42% of participants answered the questionnaire.

Completion of the questionnaire was performed at the adolescents' homes, recreational areas, public sites, schools, and at institutions providing health services.

For application of the instrument in the schools and Health Centers, the permission of the authorities was sought and obtained.

In the conurban zone comprising the three cities, there are 28 Health Centers that depend on the Health Ministry of the State of Tamaulipas. An Adolescent Health Care Module is installed at the most important and best equipped Health Center. For application of questionnaires, participation was requested and female adolescents aged 13-19 years were identified, pregnant and not pregnant, these arrived at these centres to ask for medical care.

Pregnant adolescents and those diagnosed with any other pathology were referred for care of their disease(s) to the corresponding Medical Service Unit.

### **Data collection**

To determine the level of understanding of questionnaire items, we conducted two pilot studies. In each of these studies, 20 individuals were interviewed with 15-day difference between them. Questions were closed, multiple choice, and binomial, grouped in four blocks.

In the first block, we included questions to document the age of the adolescents, anthropometric measurements, civil status, if they had children, schooling, history of health-risk habits, and behaviors such as active smoking, consumption of alcoholic beverages, and sexual activity. Similarly, we documented the adolescents' sexual education level and communication with their parents on sexuality themes. Additional information was collected on the health-risk habits and behaviors of the female friends with whom the study participants socialized most frequently.

In the second block of the questionnaire, we gathered family information, such as the civil status of the parents, whether the adolescent lived with one or both biological parents, etc.

In the third and fourth blocks, we requested information on the adolescent's mother and father, respectively, regarding age, occupation, schooling, smoking and alcoholism, etc.

### **Measures**

#### **Unplanned pregnancy**

Information related with this dependent variable was collected by means of two questions: First, the adolescent was asked whether she was pregnant at present. For the analysis in this study, this group of adolescents was identified as 1. Pregnant, and 0. Not pregnant.

Subsequently, in the case of being pregnant, the adolescent was asked: Prior to becoming pregnant, did you plan your pregnancy? This nominal variable was codified as: 1 = Unplanned pregnancy if the adolescent's response was "NO" and 0 = Planned pregnancy if the adolescent's response was "YES".

#### **Active smoking**

Measurement of this variable was obtained from participant response to the following: A. Do you smoke? Response options were (1) Yes, at least one cigarette daily, (2) Yes, but less than one cigarette a week, (3) Yes, at least one cigarette per month, (4) Yes, but only on special occasions, and (5) No, I do not smoke. We considered these adolescents as active smokers when they reported to smoke at least one cigarette a week. This independent variable was coded as 1 = Smoker, and 0 = Non-smoker.

#### **Consuming alcoholic beverages**

Measurement of this variable was obtained from the participant's response to the following: A. Do you consume alcoholic beverages? Response options were: (1) Yes, at least once daily; (2) Yes, but less than once a week; (3) Yes, at least once per month; (4) Yes, but only on special occasions, and (5) No, I do not consume alcoholic beverages. We considered these adolescents as consumers of alcoholic beverages when they reported consumption of alcohol at least once a week. This independent variable was coded as 1 = Consumes alcoholic beverages, and 0 = Doesn't consume alcoholic beverages.

#### **Family structure**

Based on the presence or absence of one or both biological parents, this variable was coded as follows: 1 = Non-intact family if the adolescent lived with one or with no biological parent or 0 = Intact family if the adolescent lived with both biological parents.

#### **Smoking at home**

Smoking at home was considered present when at least one of the adolescent's parents smoked. This independent variable was coded as 1 = Smoking at home, and 0 = No smoking at home.

### Alcohol consumption at home

Alcohol consumption at home was considered present when at least one of the adolescent's parents consumed alcoholic beverages. This independent variable was coded as 1 = Alcohol consumption at home, and 0 = No alcohol consumption at home.

### Friends who smoke

We considered the presence of friends who smoke when the adolescents responded affirmatively that some or the majority of best girlfriends smoke. This variable was dichotomized as 1 = Friends who smoke, and 0 = Friends who do not smoke.

### Friends who consume alcoholic beverages

We considered having female friends who consume alcohol when the participants responded that some or the majority of their best female friends consumed alcoholic beverages. This variable was dichotomized as 1 = Friends who consume alcoholic beverages, and 0 = Friends who do not consume alcoholic beverages.

### Analyses

The prevalence of non-intact family, active smoking, at home and friends' smoking and drinking was determined to compare adolescents with unplanned and planned pregnancy. The association between independent variables with smoking and consumption

of alcoholic beverages in adolescents with unplanned pregnancy was determined by means of a multivariate logistic regression analysis. Adjusted odds ratios (AOR) and their 95% confidence intervals (95% CI) were calculated. In evaluating the association, we adjusted for the following confounders: employed mother, and the relationship of the adolescent with her mother. Data were analyzed by means of the SPSS ver.10.0 statistical package software. Any value of  $p < 0.05$  was considered significant.

### Results

From the 785 of pregnant adolescents identified in this study, the prevalence of unplanned pregnancy was 59.5%.

In the group of adolescents with unplanned pregnancy, the percentage of active smoking was 21.2% and consumption of alcoholic beverages, 41.5%. The prevalence of smoking and alcohol consumption at home was 57.4% and 77.5%, respectively. Approximately, 80.3% of adolescents with unplanned pregnancies had friends who smoked and 90.6% of these consumed alcoholic beverages. Table 1 shows that the percentages of active smoking, smoking and alcohol consumption at home, and friends who smoke or consume alcoholic beverages was higher in adolescents with unplanned pregnancies compared with adolescents who reported planned pregnancies.

**Table 1. Distribution of the frequencies of the adolescents studied with relation to risk factors for unplanned pregnancy.<sup>a</sup>**

	Pregnancy ( $n = 785$ )				X <sup>2</sup>
	Planned ( $n = 318$ )		Unplanned ( $n = 467$ )		
	<i>n</i>	(%)	<i>n</i>	(%)	
Age (years)					
<15	13	(4.1)	25	(5.4)	0.75
Active smoking	39	(12.3)	99	(21.2)	1.26*
Alcoholic beverage consumption	105	(33.0)	194	(41.5)	1.15*
Non-intact family	159	(50.0)	157	(33.6)	0.75
Smoking at home	140	(44.0)	268	(57.4)	1.24*
Alcohol consumption at home	192	(60.4)	362	(77.5)	1.43*
Friends who smoke	236	(74.2)	375	(80.3)	1.16*
Friends who consume alcoholic beverages	270	(84.9)	423	(90.6)	1.27*

<sup>a</sup>The results are expressed by number (%). \* $P < 0.05$ ;  $p > 0.05$ .

## Smoking

A higher percentage of adolescents who smoke (Table 2) was found in youngsters with unplanned pregnancies who resided in a non-intact family (28.0 vs. 13.2%),

who had friends who smoke (25.3 vs. 15.7%), or who consumed alcoholic beverages (23.2 vs. 14.1%) compared with adolescents with planned pregnancies who resided in an intact family and who did not have friends who smoke or consume alcoholic beverages.

**Table 2. Multivariate logistic regression analysis of factors that are associated with the smoking among adolescents with unplanned and planned pregnancy**

	Smoking					
	Unplanned pregnancy ( <i>n</i> = 467)			Planned pregnancy ( <i>n</i> = 318)		
	Yes/No	%	Adjusted OR (95% CI) <sup>a</sup>	Yes/No	%	Adjusted OR (95% CI) <sup>a</sup>
Non-intact family						
Yes	44/113	28.0	1.77(1.11-2.84)*	21/138	13.2	0.85(0.43-1.69)
No	55/255	17.7		18/141	11.3	
Smoking at home						
Yes	58/210	21.6	1.30(0.81-2.08)	20/120	14.3	1.38(0.70-2.71)
No	41/158	20.6		19/159	10.7	
Alcohol drinking at home						
Yes	80/282	22.1	1.33(0.76-2.36)	25/167	13.0	1.15(0.57-2.34)
No	19/86	16.1		14/112	11.1	
Friends who smoke						
Yes	95/280	25.3	8.46(3.00-23.86)*	37/199	15.7	7.49(1.76-31.87)*
No	4/88	4.3		2/80	2.4	
Friends who consume alcoholic beverages						
Yes	98/325	23.2	13.86(1.87-102.52)*	38/232	14.1	8.25(1.10-61.95)*
No	1/43	2.3		1/47	2.1	

<sup>a</sup>Adjusted for the variables employed mother and the relationship of the adolescent with her mother. AOR = Adjusted Odds ratio; 95% CI = 95% Confidence interval. \**P* <0.05; *p* >0.05.

Results of the multivariate logistic regression analysis showed that living in a non-intact family household (Adjusted OR [AOR] = 1.77; 95% CI = 1.11-2.84), is associated with the habit of smoking in adolescents with unplanned pregnancies, but not in those with planned pregnancies (AOR = 0.85; 95% CI = 0.43-1.69). On the other hand, the presence of friends who smoked or who consumed alcoholic beverages was significantly associated with smoking in both groups of adolescents, in those with unplanned pregnancies (AOR = 8.46; 95% CI = 3.00-23.86 and AOR = 13.86; 95% CI = 1.87-102.52) and in the group with planned pregnan-

cies (AOR = 7.49; 95% CI = 1.76-31.87 and AOR = 8.25; 95% CI = 1.10-61.95 respectively).

## Consumption of alcoholic beverages

The prevalence (Table 3) of adolescents with unplanned pregnancies who consumed alcoholic beverages was greater in those who resided in a non-intact family (51.6 vs. 32.7%), with smoking at home (43.1 vs. 40.6%), or who had friends who smoked (44.0 vs. 36.4%) compared with adolescents with planned pregnancies who resided in an intact family and who did not have smoking at home or friends who smoked.

**Table 3. Multivariate logistic regression analysis of factors that are associated with the consumption of alcoholic beverages among adolescents with unplanned and planned pregnancy**

	Consumption of alcoholic beverages					
	Unplanned pregnancy ( <i>n</i> = 467)			Planned pregnancy ( <i>n</i> = 318)		
	Yes/No	%	Adjusted OR (95% CI) <sup>a</sup>	Yes/No	%	Adjusted OR (95% CI) <sup>a</sup>
<b>Non-intact family</b>						
Yes	81/76	51.6	1.79(1.17–2.74)*	52/107	32.7	0.92(0.56–1.49)
No	113/197	36.5		53/106	33.3	
<b>Smoking at home</b>						
Yes	98/170	36.6	0.80(0.53–1.21)	55/85	39.3	1.64(1.01–2.66)*
No	96/103	48.2		50/128	28.1	
<b>Alcohol drinking at home</b>						
Yes	156/206	43.1	1.47(0.91–2.39)	78/114	40.6	2.31(1.36–3.91)*
No	38/67	36.2		27/99	21.4	
<b>Friends who smoke</b>						
Yes	165/201	44.0	2.11(1.25–3.55)*	86/150	36.4	2.01(1.11–3.65)*
No	29/63	31.5		19/63	23.2	
<b>Friends who consume alcoholic beverages</b>						
Yes	192/231	45.4	17.35(4.14–72.65)*	100/170	63.0	6.71(2.51–17.93)*
No	2/42	4.5		5/43	10.4	

<sup>a</sup>Adjusted for the variables employed mother and the relationship between the adolescent and her mother. AOR = Adjusted Odds ratio; 95% CI = 95% Confidence interval. \**P* <0.05; *p* >0.05.

Results of the multivariate logistic regression analysis show that living in a non-intact family household (AOR = 1.79; 95% CI = 1.17–2.74) was associated with the consumption of alcohol in adolescents with unplanned pregnancies but not in those with planned pregnancies (AOR = 0.92; 95% CI = 0.56–1.49). On the other hand, having friends who smoked (AOR = 2.11; 95% CI = 1.25–3.55 vs. AOR = 2.01; 95% CI = 1.11–3.65), or having friends who consumed alcoholic beverages (AOR = 17.35; 95% CI = 4.14–72.65 vs. AOR = 6.71; 95% CI = 2.51–17.93) were associated with the consumption of alcoholic beverages in adolescents with unplanned and planned pregnancies.

### Discussion

Our results show that living in a non-intact family household and the presence of friends who smoke and/or consume alcohol appear to be associated with smoking and consumption of alcoholic beverages among adolescents with unplanned pregnancies.

According to the analysis in this study, from the total sample, 25% of adolescents were pregnant. This prevalence of pregnant adolescents is higher than those re-

ported in the United States of America (6%)<sup>10</sup> and in South Africa (19.2%)<sup>12</sup>

Previous publications have shown that the rates of smoking and consumption of alcohol among adolescents with unplanned pregnancies are higher than those found in adolescents without it.<sup>2</sup> The results of this study agree with those of these authors. We found that the percentage of smoking and alcohol use was higher in adolescents with unplanned pregnancies than in adolescents with planned pregnancies. Our results suggest that preventive smoking and alcoholic beverage consumption programs in general are not functioning adequately, and that these require review and reinforcement of their strategies in order to sensitize the population about the harm caused to health by smoking and alcohol use, acting mainly in groups of individuals who are vulnerable, such as female adolescents.

Living in a household with one, or no, biological parent has been associated with the development of risk habits and behaviors in adolescents.<sup>25,30,31</sup> According to the analysis, adolescents with unplanned pregnancies who

live in a non-intact family households have 1.7 times greater risk of smoking, and of consuming alcoholic beverages than those adolescents with planned pregnancies those reside with both biological parents. It is probable that this effect is due to a more tolerant attitude towards smoking by the permanent parent, or even to the unawareness and absence of parental in-home control concerning the adolescent's activities within as well as outside of the home.<sup>32,33</sup>

The results of some researchers show that socializing with friends who smoke and who consume alcoholic beverages constitutes an important risk factor for developing some health-risk behaviors, such as the use of illegal substances in adolescents.<sup>22</sup> However, the relationship between socializing with friends who have some health-risk habits such as smoking and alcohol consumption with smoking and consumption of alcoholic beverages in adolescents with unplanned and planned pregnancies has not been previously documented. According to the analyses in this study, adolescents with unplanned pregnancies who socialize with friends who smoke have 8.46-times greater risk of smoking and, if they socialize with friends who consume alcoholic beverages, the risk of smoking is 13.86 times greater compared with adolescents with planned pregnancies who have friends who smoke (AOR = 7.49) or who consume alcohol (AOR = 8.25).

On the other hand, the risk of an adolescent with unplanned pregnancy consuming beverages containing alcohol is 2.11 times if she socializes with friends who smoke and 17.35 times if her friends consume alcohol compared with the risk of alcohol use of adolescents with planned pregnancies who have friends who smoke (AOR = 2.01) or who consume alcohol (AOR = 6.71). It is possible that some of the following factors can favor this effect. Adolescence is a life stage during which changes take place in terms of organic and psychological development and adapting to society.

During this period of life, female adolescents are more willing to explore and experiment, they, on many occasions, do not consider that the decisions they make and the health-risk habits that they develop during this stage will exert an influence, whether positive or negative, on the rest of their lives. Additionally, during adolescence, young people are subjected to many pressures to acquire habits that are harmful to health. Even more, at this age, adolescents spend more time with their friends

than with their families, and the opinion of friends in relation to the acquisition of certain risky habits and behaviors can be more influential than that of their parents.

Based on the results of this study, the presence of smoking or alcohol drinking at home does not favor the development of smoking or the consumption of alcohol in adolescents with unplanned pregnancies but it does in adolescents with planned pregnancies. However, it is noteworthy that prior investigations show that smoking and alcohol drinking at home favor the development of smoking and consuming alcohol in adolescents who are afflicted from some condition that compromises their health.<sup>34,35</sup>

According to some investigators, the association between smoking and alcohol consumption at home and the development of smoking and the consumption of alcoholic beverages in adolescents who have some condition that compromises their health is due to some of the following mechanisms. During adolescent development, the changes that present during this life stage can play a relevant role in the development of certain habits, such as smoking and alcohol use; these changes can present at younger ages and with greater frequency when they are based on direct experience, such as living with smoking parents or parents who consume alcohol.<sup>19,22,23</sup> Smoking or alcohol drinking in the adolescents' home can be perceived by these young people as a sign that smoking or consuming alcoholic beverages is not harmful to health.<sup>34,35</sup>

### **Limitations and strengths**

This study possesses the following methodological limitations that should be taken into consideration on generalizing its results: a) Detection of smoking and consumption of alcoholic beverages was performed through self-administered questionnaires: no objective tests to diagnose smoking or drinking, such as pulmonary function tests, carbon dioxide measurements, or blood alcohol level, were conducted. However, past investigations have shown that the use of self-reported questionnaires can be considered effective for measuring the diagnosis of smoking and drinking in epidemiological studies; b) On performing the statistical analysis, we found small cell counts in the logistic regression models, and d) this is a cross-sectional study; thus, no causal relationship can be established.

## Conclusion

Living in an incomplete family household and the presence of friends with some health-risk behavior are associated with smoking and consumption of alcoholic beverages in adolescents with unplanned and planned pregnancies. It would appear that the same factors induce smoking and the consumption of alcohol in adolescents with unplanned and planned pregnancies.

On the other hand, pregnancy in adolescents (planned or not planned), is associated with other risk factors such as smoking and drinking.

It is important for adolescent health-care programs to be revised and for their strategies to be strengthened in order to reach the objectives for which they were created.

## Funding

This work was supported by the Mixed Fund for the Promotion of Scientific and Technological Research, conacyt-Tamaulipas State Government (Grant code: TAMPS-2011-C35-176437).

## Declaration of interests:

The authors declare to have no conflict of interest directly or indirectly related to the manuscript contents.

## References

1. Ayoola AB, Brewer J, Nettleman M. Epidemiology and prevention of unintended pregnancy in adolescents, Primary Care: *Clinics in Office Practice* 2006; 33(2):391-403.
2. Prietsch SO, González-Chica, DA, César JA, Mendoza-Sassi, RA. Unplanned pregnancy in southern Brazil: prevalence and associated factors, *Cad Saude Publica* 2011; 27(10):1906-16.
3. Spicák J, Pulkertová A, Králová-Lesna I, Suchánek P, Vitáskpva M, Adamkpva V. The coincidence of alcoholic liver cirrhosis and chronic pancreatitis, *Vnitř Lek* 2011; 57(12): 1045-52.
4. Pabayo R, Molnar BE, Kawachi I. Witnessing a Violent Death and Smoking, Alcohol Consumption, and Marijuana Use among Adolescents, *J Urban Health Bull NY Acad Med* 2013; 91(12):335-54.
5. Swendsen J, Burstein M, Case B, Conway KP, Dierker L, He J, Merikangas KR. Use and abuse of alcohol and illicit drugs in US adolescents: results of the National Comorbidity Survey-Adolescent Supplement, *Arch Gen Psychiatry* 2012; 69(4):390-8.
6. Odukoya OO, Sekoni AO, Onajole AT, Upadhyay RP. Alcohol consumption and cigarette smoking pattern among brothelbased female sex workers in two local government areas in Lagos state, Nigeria. *African Health Sciences* 2013; 13(2): 490 - 497
7. World Health Organization. Adolescent Pregnancy. World Health Organization. Department of Child and Adolescent Health and Development, Geneva, Switzerland, WHO 2004; 1-92.
8. Singh S, Sedgh G, Hussain R. Unintended pregnancy: worldwide levels, trends, and outcomes, *Stud Fam Plann* 2010; 41(4):241-50.
9. Zureick-Brown S, Newby H, Chou D, Mizoguchi N, Say L, Suziki E, Wilmoth J. Understanding global trends in maternal mortality. *International Perspectives on Sexual and Reproductive Health* 2013; 39(1):32-41.
10. Guttmacher Institute. Facts on American Teens' Sexual and Reproductive Health, 2011, [Accessed December 25, 2013].<http://www.guttmacher.org/pubs/FB-ATSRH.html>
11. Kost K, Finer LB, Singh S. Variation in state unintended pregnancy rates in the United States, *Perspectives on Sex and Reproductive Health* 2011;44(1):57-64.
12. Mchunu G, Peltzer K, Tutshana B, Seutlwadi L. Adolescent pregnancy and associated factors in South Africa youth. *African Health Sciences* 2012; (4): 426 - 434
13. Amy JJ, Loeber O. Pregnancy during adolescence: a major social problem, *Eur J Contracept Reprod Health Care* 2007; 12(4):299-302.
14. Vaisanen H, Murphy M. Social inequalities in teenage fertility outcomes: childbearing and abortion trends of three birth cohorts in Finland, *Perspectives on Sexual and Reproductive Health* 2014; 46(2):109-116.
15. Burd L, Blair J, Dropps K. Prenatal alcohol exposure, blood alcohol concentrations and alcohol elimination rates for the mother, fetus and newborn, *Journal of Perinatology* 2012; 32:652-9.
16. Wood D. Fetal Alcohol Syndrome. (Alcohol in Pregnancy; Drinking Alcohol During Pregnancy; FAS), Nucleus Medical Media, Inc. 2011. [Http://www.munsonhealthcare.org/Taxonomy/relateddocuments.aspx?Id=0&sid=1&EBSCOID=11869&lang=English&db=hlt](http://www.munsonhealthcare.org/Taxonomy/relateddocuments.aspx?Id=0&sid=1&EBSCOID=11869&lang=English&db=hlt)
17. Simoes C, Matos MG, Rivera F, Batista-Foguet JM, Simons-Morton B. Substance use in Portuguese and Spanish adolescents: highlights from differences, similarities and moderating effects, *Span J Psychol* 2012; 15(3):1024-37.
18. Connery HS, Albright BB, Rodolico JM. Adolescent substance use and unplanned pregnancy: strategies for risk reduction. *Obstet Gynecol Clin North Am.* 2014. 41(2):191-203



19. Fang L, Barnes-Ceeney K, Schinke SP. Substance use behavior among early-adolescents Asian American girls: the impact of psychological and family factors, *Women Health* 2008; 51(7):623-42.
20. Rodríguez GMA. Factores de riesgo para embarazo en adolescentes, *Medicina Universidad Pontificia Bolivariana* 2008; 27(1):47-58.
21. Lakon CM, Hipp JR, Timberlake DS. The social context of adolescent smoking: a systems perspective, *Am J Public Health* 2010; 100(7):1218-28.
22. Schinke SP, Fang L, Cole KCA. Substance use among early adolescent girls: risk and protective factors. *J Adolesc Health* 2008; 43(2):191-4.
23. Korn L, Magnezi R. Cigarette and nargila (water pipe) use among Israeli Arab high school students: prevalence and determinants of tobacco smoking, *the-scientificworldjournal: Child Health and Human Development* 2008; 8:517-25.
24. Marston M, Beguy D, Kabiru C, Cleland J. Predictors of sexual debut among young adolescents in Nairobi's informal settlements. *International Perspectives on Sexual and Reproductive Health* 2013; 39(1):22 -31
25. Curto BM, Paula CS, do Nascimento R, Murray J, Bordin IA. Environmental factors associated with adolescent antisocial behavior in a poor urban community in Brazil, *Soc Psychiatry Psychiatric Epidemiol* 2011; 46(12):1221-31.
26. Vázquez NF, Saldívar GAH, Martínez PGM, Lin OD, Barrientos GMC, Vázquez REM, Vázquez RC, Beltrán GFJ. Association between family history of allergy, exposure to tobacco smoke, active smoking, obesity, and asthma in adolescents. *Arch Bronconeumol* 2006;42:621-6
27. Secretaría de Salud. Consejo Nacional contra las Adicciones. Metodología para la elaboración de estudios epidemiológicos a nivel nacional y local y estudios para grupos especiales relacionados con las adicciones México, D.F. 2003
28. Núñez-Urquiza RM, Hernández-Prado B, García-Barrios C, González D, Walker D. Embarazo no deseado en adolescentes, y utilización de métodos anticonceptivos posparto, *Salud Publica Mex* 2003; 45:S92-S102
29. Mosher WD, Jones J, Abma JC. Intended and unintended births in the United States: 1982-2010, National Health statistics reports; no 55. Hyattsville, MD, USA: National Center for Health Statistics. 2012
30. Becoña E, Martínez U, Calafat A, Juan M, Duch M, Fernández-Hermida JR. How does family disorganization influence children's drug use? A review. *Adicciones* 2012; 24(3):253-68.
31. Jovic S, Delpierre C, Ehlinger V, Sentenac M, Young H, Arnaud C, Godeau E. Association between life contexts and early sexual initiation among young women in France, *Perspectives on Sexual and Reproductive Health* 2014; 46(1):31-39
32. Grenard JL, Guo Q, Jasuja GK, et al. Influences affecting adolescent smoking behavior in China, *Nicotine & Tobacco Research* 2006; 8(2):245-55.
33. Shelley D, Fahs MC, Yerneni R, Qu J, Burton D. Correlates of household smoking bans among Chinese Americans, *Nicotine & Tobacco Research* 2006; 8(1):103-12.
34. Otten R, Engels RC, Van Den Eijnden RJ. Parental smoking and smoking behavior in asthmatic and nonasthmatic adolescents, *J Asthma* 2005;42(5):349-55.
35. Zbikowski SM, Klesges RC, Robinson LA, Alfano CM. Risk factors for smoking among adolescents with asthma, *J Adolesc Health* 2002; 30(4):279-87.