DAILY CIGARETTE SMOKING AMONG COLOMBIAN HIGH SCHOOL STUDENTS: GENDER RELATED PSYCHOSOCIAL FACTORS[1]

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Martínez-Mantilla JA, Amaya-Naranjo W, Alfredo Campillo H, Díaz-Martínez LA, Campo-Arias A. Daily cigarette smoking among colombian high school students: gender related psychosocial factors. Rev Latino-am Enfermagem 2008 setembro-outubro; 16(5):903-7.

This study aimed to establish the prevalence of daily cigarette smoking (DCS) and its gender correlated factors in high-school attending adolescents from Bucaramanga, Colombia. A random cluster sample was surveyed (N = 2291). The previous month DCS prevalence was 11.6% (95% CI 9.7-13.5) in boys and 4.4% (95% CI 3.3-5.5) in girls. In girls, DCS was associated with previous month illegal substance use (OR 8.13, 95%CI 3.52-18.87), abusive alcohol consumption (OR 5.88, 95% CI 2.54-13.70), being the best friend of a smoker (OR 3.25, 95% CI 1.38-7.63), and poor or mediocre academic achievement (OR 2.46, 95% CI 1.25-4.85). In boys, DCS was related to previous month substance use (OR 6.23, 95% CI 3.62-10.71), being the best friend of a smoker (OR 5.87, 95% CI 2.93-11.76), poor or mediocre academic achievement (OR 2.09, 95% CI 1.34-3.24), and being older than non-smokers (OR 1.48, 95% CI 1.21-1.81). DCS presents associated factors very similar for girls and boys. Thus, more research is needed.

DESCRIPTORS: smoking; prevalence; students; cross-sectional studies

CONSUMO DIARIO DE CIGARRILLO EN ADOLESCENTES ESTUDIANTES: FACTORES PSICOSOCIALES RELACIONADOS CON EL GÉNERO

El objetivo fue establecer la prevalencia y los factores asociados a consumo diario de cigarrillo (CDC) en adolescentes estudiantes de Bucaramanga, Colombia. Una muestra aleatoria por conglomerado fue investigada (n = 2.291). La prevalencia de CDC durante el último mes fue 11,6% (IC 95% 9,7-13,5) en varones y 4,4% (IC 95% 3,3-5,5) en mujeres. En mujeres, el CDC se asoció a consumo de alguna sustancia ilegal (OR 8,13, IC95% 3,52-18,87), consumo abusivo de alcohol (OR 5,88, IC 95% 2,54-13,70), mejor amigo fumador (OR 3,25, IC 95% 1,38-7,63) y pobre o regular rendimiento académico (OR 2,46, IC95% 1,25-4,85). En varones, el CDC se relacionó con consumo de alguna sustancia ilegal (OR 6,23, IC 95% 3,62-10,71), mejor amigo fumador (OR 5,87, IC 95% 2,93-11,76), pobre o regular rendimiento académico (OR 2,09, IC 95% 1,34-3,24) y más años de edad (OR 1,48, IC 95% 1,21-1,81). El CDC presenta muy similares factores asociados en mujeres y varones. Se necesitan más investigaciones.

DESCRIPTORES: tabaquismo; prevalencia; estudiantes; estudio transversal

CONSUMO DIÁRIO DE CIGARRO EM ADOLESCENTES: FATORES PSICO-SOCIAIS RELACIONADOS COM O GÊNERO

O objetivo foi estabelecer a prevalência e os fatores associados ao consumo diário de cigarro (CDC) em adolescentes estudantes de Bucaramanga, Colômbia. Uma amostra aleatória por conglomerados foi investigada (n= 2.291). A prevalência de CDC durante o último mês foi 11,6% (IC 95% 9,7-13,5) em varões e 4.4% (IC 95% 3,3-5,5) em mulheres. Em mulheres, o CDC associou-se ao consumo de alguma substância ilegal (OR 8,13; IC 95% 3,52-18,87), consumo abusivo de álcool (OR 5,88, IC 95%2,54-13,7), melhor amigo fumador (OR 3,25, IC 95% 1,38-7,63) e pobre o regular rendimento acadêmico (OR 2,46, IC 95% 1,25-4,85). Em varões, o CDC relacionou-se com o consumo de alguma substancia ilegal (OR 6,23, IC 95% 3,62-10,71), melhor amigo fumador (OR 5,87, IC 95% 2,93-11,76), pobre o regular rendimento acadêmico (OR 2,09, IC95% 1,34-3,24) e mais anos de idade (OR 1,48, IC 95% 1,21-1,81). O CDC apresenta similares fatores associados em mulheres e varões. Precisam-se de mais pesquisas.

DESCRITORES: tabagismo; prevalência; estudantes; estudos transversais

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INTRODUCTION

Adolescence is a complex transition from childhood to adulthood when biological and physical growth are simultaneously associated with behavioral and social changes. In this important period of life, healthy and unhealthy practices or behaviors, which can have short and long-term consequences, are consolidated.

Tobacco use is the leading preventable cause of death in the world. Cigarettes are the most commonly used tobacco product among adolescents. Cigarette smoking generally begins in adolescence and it is very important to distinguish initiation from maintaining cigarette smoking. One study reported that during 1999 and 2000, 48.5% of American adolescents had experimented cigarettes, but only 7.8% of them were regular smokers[1].

Regional differences in adolescent cigarette smoking have been well documented, however, definitions of current smoker are dissimilar. The differences mainly refer to the number of cigarettes smoked. Some studies define current adolescent smoker as the person who reports cigarette use in at least one day within the previous six months, in the previous 30 days, or in the previous week. In some studies, current smoker is the person who smoked everyday during the previous week. These discrepancies about current smoking definition are of great magnitude because they include heterogeneous populations. Other researchers classify current adolescent smokers in two categories: regular or daily (everyday cigarette smoking within the previous month) and occasional or non-daily (not everyday smoking in the previous month)[2]. Moreover, DCS during one month is required to meet the duration criterion for nicotine dependence according to World Health Organization and American Psychiatric Association. Nicotine dependence explains why people continue to smoke and this diagnosis is increasing among adolescents. Some studies support regular and occasional smokers categories. Regular adolescent smokers have a higher risk of health compromising behaviors, mental disorders, and physical diseases related to chronic tobacco use than occasional smokers[3].

Few studies report daily cigarette smoking prevalence during the previous month among high-school adolescents. The prevalence of DCS is between 1.3% and 23.0% depending on gender, grade, ethnicity and religion[4-8]. Studies on Colombian cigarette smoking among high school students are scarce[9-11]. One research reported prevalence of daily cigarette smoking of 7.7% among 11th grade students in Medellín[9] and another found prevalence of 16.0% in high school students (10th and 11th grade) from Bucaramanga[10]. These studies used the same questionnaire for substance use epidemiological survey (VESPA), however, this instrument is sufficiently accurate if cigarette consumption occurs everyday during the previous month. Another study documented that 11.0% of 10th grade students enrolled in public schools in Bogotá had smoked every day in the previous month[11].

DCS is associated with sociodemographic characteristics like being a male[4-6] and a Caucasian instead of an Afro-American or a Latin-American[6-7]; with individual characteristics, for instance, low self-perceived academic ability[11]; and also with contextual factors, that is, smoking among parents, siblings and friends[5-8], and other health risk behaviors like abusive alcohol consumption or illegal substance use[11].

DCS is a public health problem that starts in early adolescence and consolidates in late adolescence or early adulthood[1]. DCS could be prevented if factors related were known and handled from the beginning.

This study aims to know the prevalence of DCS among a random cluster sample of high school students in Bucaramanga, Colombia, and to identify some related factors omitted in other studies such as unusual eating behaviors. Smoking can be a strategy of weight control among young people. Additionally, a more sophisticated statistical analysis is used in order to control confounding variables omitted in Colombian previous research.

METHOD

This study used a cross-sectional design. It was approved by the Review Board of the School of Medicine of the Universidad Autónoma de Bucaramanga, the schools' directors, parents and students. According to the Colombian law this research represents minimum risk for participants and guarantees their confidentiality. All data were collected in 2004, during the academic year from April 1st to October 29th.

A random representative sample by clusters of high school adolescents was evaluated from a 24.245 eligible students who were attending 191 private and public schools. The sample selection was multistage. In Colombia, high school academic years have two grades, 10th and 11th. This sample was calculated to detect prevalence higher than 3.5%, with error size of 1%, and a significance of 5%.

Participants received, in the classrooms, an envelope with a self-reported, voluntary, confidential and anonymous questionnaire. This survey was based on the Questionnaire for Substance Use Epidemiological Survey among Colombian High School Adolescents (VESPA, in Spanish). This format asks about legal (cigarette, alcohol, and sedatives) and illegal substance use (cannabis, opiates, and ecstasy or methilendioxy methamphetamine). VESPA information on cigarette use was complemented with one question that clearly inquired about DCS during the previous month: Have you smoked everyday within the last month?

To identify adolescents with abusive alcohol consumption, the CAGE questionnaire was used. Scores similar or higher than three was considered positive[12]. This scale has presented good sensitivity (60-90%) and acceptable specificity (40-60%) in several populations. To estimate the presence of potential eating disorders, adolescents filled out the SCOFF questionnaire. This five-item tool was designed to screen eating disorders symptoms among girls. Two or more positive answers are suggestive of eating disorders. This scale has been validated with Colombian female students.

The Statistical Package for Social Sciences for Windows (SPSS for Windows 12.0) was used for all analyzes. Differences were determined establishing prevalence ratios (PR) for categorical variables. PR is recommended for cross-sectional studies instead of OR (Odds ratio). To compare means and standard deviations (SD) the Student's t test is used. A logistic regression was used for multivariate analysis. The final model included variables that reached p-values lower than 0.20 according to Greenland's recommendations. The Hosmer-Lemeshow goodness-of-fit test was used to examine the fitness of the logistic models. It is known that the internal consistency of a scale is a property of a population, thus, the internal consistency of the CAGE and the SCOFF questionnaires in this sample was measured through the Kuder and Richardson's formula 20. This statistical test is mathematically equivalent to Cronbach's alpha and it is used when the scale has a dichotomous answer pattern.

RESULTS

A group of 2.304 students completed the survey. Thirteen (0.56%) students were excluded because they reported inconsistencies or did not complete the questionnaires. A total of 2291 questionnaires were analyzed.

Fifty four percent of the population was male. Ages ranged from 12 to 20 years; the mean age was 15.9 (SD 1.09); mean was 16.1 (SD 1.25) for males; and 15.9 (SD 1.04) for females. A total of 70.9% attended public schools. 52.3% attended the 11th grade and 47.7% the 10th. According to socioeconomic level, 5.5% lived in level I; 6.9% in II; 25.9% in III; 25.5% in IV; 14.1% in V; 15.2% in VI; and in 6.9% it is missing.

Health self-perception was classified as excellent by 36.9%; good by 45.4%; mediocre by 15.5% and poor by 2.2%. Academic achievement was classified as excellent by 15.9%; good by 50.2%; mediocre by 26.0%; and poor by 7.9%. A total of 47.8% reported their best friend smoked; 62.9% reported that brothers or sisters smokd; 6.6% reported the use of some substance (not including alcohol); 6.6% were positive for CAGE; and 31.8% for SCOFF.

The total prevalence of DCS was 7.7% (95% CI 6.6-8.8). Internal consistency of SCOFF questionnaire was 0.60 for females and 0.49 for males, respectively. Internal consistency for the CAGE questionnaire was 0.58 for females and 0.59 for males.

Bivariate analysis for females showed that DCS was more common in older students than in younger students (16.3 years, SD 1.28, versus 15.9, SD 1.02; t=2.57, df=1235, p=0.010). For males, DCS was more frequent in older students than in younger ones (16.6 years, SD 1.19, versus 16.0, SD 1.13; t=5.60, df=1053, p=0.000). The DCS prevalence was 4.4% (95% CI 3.3-5.5) among females compared to 11.6% (95% CI 9.7-13.5) for males (PR 2.81, 95% CI 2.02-3.90).

After controlling confounding variables in females, DCS was associated with the use of any substance during the previous month, abusive alcohol consumption (CAGE positive), being the best friend of a smoker, and also with poor or mediocre academic

achievement. For females, these factors for DCS adjusted for other variables are presented in Table 1. In males DCS was related to the use of some substance in the previous month, being the best friend of a smoker, poor or mediocre academic achievement, and being older than non-smokers. For males, this multivariate model is presented in Table 2.

Table 1 - Daily cigarette smoking among high-school female students from Bucaramanga, Colombia, adjusted for confounding variables

Variables	OR	95% CI	p
Substance use previous month	8.13	3.52-18.87	0.000
Positive for abusive alcohol consumption	5.88	2.54-13.70	0.000
Best friend smokes	3.25	1.38-7.63	0.007
Poor or mediocre academic achievement previous month	2.46	1.25-4.85	0.009
Studies in private school	1.77	0.90-3.48	0.097
Low social economic level	1.72	0.69-4.29	0.240
Positive for eating disorders	1.70	0.83-3.45	0.140
Poor or mediocre health self-perception previous month	1.60	0.80-3.21	0.182
Being older	1.15	0.85-1.55	0.366
Brothers, sisters or parents smoke	1.09	0.50-2.39	0.824

Hosmer-Lemeshow goodness-of-fit: X^2=2.67 df=8 p=0.953

Table 2 - Daily cigarette smoking among high-school male students from Bucaramanga, Colombia, adjusted for confounding variables

Variables	OR	95% CI	p
Substance use previous month	6.23	3.62-10.71	0.000
Best friend smokes	5.87	2.93-11.76	0.000
Poor or mediocre academic achievement previous month	2.09	1.34-3.24	0.001
Studies in private school	1.77	0.90-3.48	0.000
Being older	1.48	0.81-1.81	0.366
Positive for abusive alcohol consumption	1.35	0.73-2.51	0.344
Low social economic level	1.18	0.67-2.09	0.564
Brothers, sisters or parents smoke	1.11	0.65-1.89	0.696
Academic grade (11th)	1.04	0.64-1.67	0.882
Positive for eating disorders	1.03	0.61-1.72	0.929

Hosmer-Lemeshow goodness-of-fit: X^2=6.06 df=8 p=0.641

DISCUSSION

This investigation reports an important prevalence of DCS in high school students in Bucaramanga, Colombia. DCS was strongly associated with substance use, the best friend being a smoker, and poor or mediocre academic achievement, in both females and males. Some researchers have reported on the prevalence among adolescents[4-8,11]. In United States, 21.9% of high school attending students had smoked at least once within the previous 30 days, and 9.7% had smoked 20 or more times in the previous 30 days. However, this study omitted information about DCS[13], 10.2% of a representative sample of 6,504 adolescents residing in the United States, smoked 26-30 days within past month[14]. Other investigations reported everyday cigarette smoking in the previous 30 days. One study reported a prevalence of 19.4% in students from different ethnic residents in United States[4]. Among Muslim Arab-American adolescents, 12% of them were daily cigarette smokers[5]. It was also observed in the United Stated that 18.0% of middle-, junior-, and high-school students were regular smokers during the previous 30 days[6]. In Portugal, 1.3% of thirteen-year old students were daily smokers[7]. Icelandic adolescent students 8.8% reported daily smoking[8]; and in Colombia, 11.0% of 10th grade students of public schools[11].

Regarding gender, data are consistent with previous reports, that is, the prevalence of DCS is higher in boys than in girls[5,11,13-14] However, one research found that girls were most often daily cigarette smokers than boys[7]. Behavioral risks related to DSC, and their strength, are a little different for females and males. Although, after adjusting for potential confounding variables, it was found that abusive alcohol consumption was a factor associated with DSC for females but not for males. It is possible that sociocultural factors can explain this divergence. However, these findings need further investigation.

DCS was also related to substance use and poor or mediocre academic achievement during the previous month. Previous studies have reported similar findings[5,11]. It has been proven that cigarette smoking is a gateway to other and more problematic substance consumption[11]. Likewise, cognitive and physiological effects of substances deteriorate school performance, which suggests an indirect relationship between cigarette smoking and academic achievement. However, it is necessary to keep in mind that both outcomes, substance use and poor or mediocre academic performance, might be explained by other adjacent mental disorders like depressive disorders. Depressive disorders increase the risk of substance use or abuse and significantly impair academic functioning.

It is well known that a very important factor for starting smoking is related to social influences. An adolescent with a close friend who is a smoker is

more likely to become a smoker than one who does not have a close smoker friend[5-9].

Smoking is associated to eating disorders symptoms. The present study does not corroborate this association. Probably, sociocultural factors are playing an important role. Eating disorders are strongly related to environmental causes.

Smoking is a main medical concern. At least a quarter of DCS adolescents meet criteria for nicotine dependence, and this population represents a real public health problem. Adolescents who establish a daily pattern of cigarette consumption have more difficulty quitting smoking and present a higher risk for tobacco related diseases[3]. Thus, it is important to start smoking prevention programs during childhood and early adolescence[15], and identify experimenters and occasional smokers before they establish daily cigarette use to prevent future problems[3-5].

This study present some limitations. First, it is a cross-sectional investigation and secondly, emotional symptoms such as depressive ones were not controlled for. The conclusion is that almost one of each 12 high school students presents DCS; DCS is related to substance use during the previous month, being the best friend of a smoker and presenting poor or mediocre academic achievement within the previous month, both for females and males. Therefore further research is needed.

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Recebido em: 28.8.2007
Aprovado em: 9.9.2008