

Smoking, behavioral factors and familial environment: a population based study with Brazilian adolescents

Tabaquismo, factores comportamentales y ambiente familiar: un estudio basado en población de adolescentes brasileños

Gabriella L. Arrais-Ribeiro, Marayza A. Clementino, Monalisa da N. Cesarino-Gomes, Ramon T. Firmino, Maria B. Lins Dantas-Siqueira y Ana F. Granville-García

University State of Paraíba. Campina Grande, Paraíba, Brazil. gabyarrais@hotmail.com; marayza84@gmail.com; monalisacesarino@gmail.com ;ramontargino@gmail.com; mblsiqueira@yahoo.com.br; anaflaviagg@hotmail.com

Received 10th June 2012/Sent for Modification 3th July 2012/Accepted 5th August 2012

ABSTRACT

Objective The present study was aimed at assessing the association between smoking and both behavioral and environmental factors among adolescents in the public school system in the city of Campina Grande (north-eastern Brazil).

Methods An analytical cross-sectional study was carried out involving 574 schoolchildren aged 10 to 19 years old; it involved using a structured questionnaire addressing behavioral and environmental factors and smoking. The Chi-squared test and Fisher's exact test were used for the statistical analysis (5 % level of significance).

Results Smoking prevalence was 3.3 %. The lowest age regarding tobacco use for the first time was eight years old and the 11 to 14 year old age group had the greatest frequency of initiation into this habit (44.3 %); 84.3 % of tobacco users smoked between one and 10 cigarettes per day. Smoking was associated with delays in schooling ($p=0.047$), gender ($p=0.016$), alcohol use and frequency of alcohol use ($p<0.001$) and the relationship with one's father ($p=0.014$) and mother ($p=0.004$).

Conclusions Despite the low prevalence, an early initiation into smoking was found, suggesting that educational campaigns should be directed towards younger age groups. Alcohol use stood out amongst the variables studied, suggesting that smoking is influenced by both its use and the intensity of consumption.

Key Words: Smoking, students, alcoholism, epidemiology, risk factors (*source: MeSH, NLM*).

RESUMEN

Objetivo El objetivo del presente estudio fue evaluar la asociación entre el tabaquismo, los factores comportamentales y los factores ambientales entre adolescentes de escuelas públicas de Campina Grande-Paraíba.

Métodos El estudio realizado fue de tipo transversal analítico, en el cual participaron

574 adolescentes, entrevistados por medio de un cuestionario estructurado que contenía preguntas relacionadas con factores comportamentales y ambientales y con el tabaquismo. Las pruebas estadísticas utilizadas fueron el Chi-Cuadrado y la prueba exacta de Fisher (5 % nivel de significancia).

Resultados La prevalencia del tabaquismo fue de 3,3 %. La menor edad relacionada con el inicio del uso del cigarro fue de 8 años y el grupo de edad con la mayor frecuencia de inicio fue entre 11 y 14 años (44,3 %). Se estimó que 84,3 % de los fumadores consumía entre 1 a 10 cigarros por día. El tabaquismo fue asociado al fracaso escolar ($p=0,047$), al sexo ($p=0,016$), al consumo y frecuencia de uso de alcohol ($p<0,001$) y a la relación con el padre ($p=0,014$) y con la madre ($p=0,004$).

Conclusiones A pesar de la baja prevalencia encontrada, se observó un inicio prematuro en el tabaquismo sugiriendo que las campañas educativas deben ser enfocadas en edades más tempranas. Entre las variables analizadas se destaca el uso de alcohol, lo que también sugiere que el tabaquismo puede ser influenciado tanto por el consumo, como por la intensidad del uso de esta sustancia.

Palabras Clave: Hábito de fumar, estudiantes, alcoholismo, epidemiología, factores de riesgo (*fuentes: DeCS, BIREME*).

Adolescence spans the ages of 10 to 19 years. Individuals in this phase of life undergo numerous physical, cognitive, emotional and social changes. Adolescence is marked by the search for an identity as well as extreme instability, which makes teenagers especially susceptible to experimentation with drugs, including tobacco (1).

Smoking has been associated with more than 50 diseases and currently contributes greatly to the number of avoidable deaths. Despite an overall reduction in smoking in recent decades, smoking among adolescents continues to be a challenge to public health authorities (2,3). Ninety percent of smokers become dependent by the age of 19 years (4). The susceptibility of this age group has made adolescents the target of the tobacco industry through the widespread advertising of tobacco products (5).

A study carried out in the United States reports that 1,500 of every 3,900 youths who have experimented with cigarettes become habitual smokers and, in 2002, 18 % of adolescents in the tenth grade reported smoking at least once in the previous 30 days (6). A study carried out in the United Kingdom found that 10 % of adolescents reported having smoked cigarettes in the previous week, with this figure rising to 25 % among those aged 16 years or older (7). In developing countries, prevalence values are reported to range from 8 to 22.3 % (5,8) and studies carried out in Brazil report prevalence values ranging from 6.3 to 17.7 % (9,10).

The Framework Convention on Tobacco Control (FCTC) was established by the World Health Organization (WHO) in response to the global tobacco epidemic. This was a landmark for public health and was embraced by all WHO member countries on May 21st, 2003. Brazil signed the FCTC on June 16th, 2003 and it first became effective in the country in February 2005. The FCTC contains chapters designed to protect present and future generations from the devastating health, social, environmental and economic results of tobacco consumption and exposure to tobacco smoke (11). The control of tobacco consumption has since been regarded as an ethical matter and a social responsibility of governments towards their populations (4).

The Global Youth Tobacco Survey is one of the WHO strategies for controlling smoking and has broadened discussion on this issue, as it provides a profile of the population in relation to the early exposure to tobacco and its relationship with environmental and lifestyle factors (12). The determination of the epidemiological profile of tobacco use and the analysis of behaviors, attitudes and associated factors could contribute toward a better understanding of this complex problem and guide the drafting of health programs aimed at the prevention and combating of smoking in adolescence.

The aim of the present study was to assess the association between smoking and behavioral/environmental factors among adolescents at public schools in northeastern Brazil.

METHODS

A cross-sectional study was carried out involving 574 male and female adolescents between 10 and 19 years of age at public schools in the city of Campina Grande, state of Paraíba, Brazil. The participants were selected from a population of 11,228 students, with the sample corresponding to 5.11 % of this population. Campina Grande had approximately 386 thousand inhabitants and is divided into six districts. It is an industrialized city with considerable cultural, social and economic disparities. Mean monthly income per capita is 110 US dollars and the human development index is 0.72 (13).

Two-stage sampling was performed to ensure representativity. Schools were randomly selected from each district of the city in the first stage and schoolchildren were randomly selected from each school in the second stage.

The sample size was calculated based on a 5 % margin of error, 95 % confidence level and an expected prevalence value of 50 %. A 1.3 correction factor was applied to compensate for the design effect. The minimal sample was estimated to be 496 schoolchildren, to which 20 % was added to compensate for possible losses, totaling 596 schoolchildren.

Eligibility criteria

Adolescents aged 10 to 19 years, enrolled in the schools selected for the study, who authorized (adults) or whose parents/guardians (minors) authorized their participation by signing a statement of informed consent.

Data acquisition

Data acquisition was carried out between August and December 2010 by four previously calibrated researchers using a self-administered semi-structured questionnaire previously used by the Brazilian Information Centre on Psychotropic Drugs (14). The questions addressed the smoking profile of the sample (smoker, ex-smoker, non-smoker, age at which the subject began smoking and number of cigarettes smoked per day) and associated factors (gender, age group, schooling, work, religion, practice of sports, relationship with parents and parents' profile and alcohol intake).

Alcohol intake was defined based on the following categories:

- Use in lifetime: use at least once in the individual's lifetime;
- Use in previous year: use at least once in the 12 months prior to the interview;
- Use in previous month: use at least once in the 30 days prior to the interview;
- Frequent use: use six or more times in the 30 days prior to the interview;
- Heavy use: use 20 or more times in the 30 days prior to the interview.

A smoker was defined as an individual who smoked any type or amount of tobacco on a daily basis for a period of at least six months at the time of the interview. An ex-smoker was defined as any individual who had been a smoker, but had not smoked any type or amount of tobacco in the previous six months. A non-smoker was defined as any individual who had never smoked or smoked for only a short period or sporadically at any time in life (11).

Contact with the school was initially made to schedule the data acquisition procedure and deliver the statements of informed consent. The reliability of the responses was tested using the "face validation" method on 10 % of the interviewees. For such, the researcher asked the respondents to explain what

they understood by each question in their own words (15). None of the interviewees exhibited any difficulty in answering the items on the questionnaire. Test-retest reliability was determined with a seven-day interval between applications of the questionnaire (10 % of the interviewees). Agreement between tests was 80 %.

The administration of the questionnaire lasted a period of 10 minutes. After the questionnaires were returned to the researchers, an educational lecture was given on the consequences of smoking.

All data were analyzed using the Statistical Package for Social Sciences (SPSS for Windows, version 18.0, SPSS Inc, Chicago, IL, USA). The chi-squared test and Fisher's exact test were used to determine associations between the variables and smoking, with the level of significance set to 5 % ($p < 0.05$).

Ethical considerations

This study received approval from the Human Research Ethics Committee of the University State of Paraíba (Brazil), under process number 0253.0.133.000-10, in compliance with Resolution 196/96 of the Brazilian National Health Council.

RESULTS

A total of 574 schoolchildren participated in the present study. Twenty-two individuals refused to participate, corresponding to a loss rate of 3.7 %.

Table 1. Distribution of participants according to socio-Demographic variables. Campina Grande-PB, 2011

Variable	n	%
Age group (years)		
10 to 12	161	28,0
13 to 15	309	53,8
16 to 18	100	17,4
More than 18	4	0,7
Gender		
Male	267	46,5
Female	307	53,5
Schooling		
Elementary school	503	87,6
High school	71	12,4
Total	574	100,0

Table 2. Distribution of participants according to data related to smoking. Campina Grande-PB, 2011

Variable	N	%
Smoking status		
Smoker	19	3,3
Ex-smoker	51	8,9
Non-smoker	504	87,8
Total	574	100,0
Age group		
8 to 10 years	11	15,7
11 to 14 years	31	44,3
15 to 19 years	9	12,9
Does not recall	19	27,1
Number of cigarettes smoked per day		
1 to 10	59	84,3
11 to 20	6	8,6
21 or more	5	7,1
Total	70	100,0

Gender, delays in schooling ($p=0.47$) and alcohol use and frequency of alcohol use ($p<0.00$) were associated with smoking (Table 3).

Table 3. Association between smoking and socio-demographic data, practice of sports and alcohol consumption in previous month. Campina Grande-PB, 2011

Variable	Smoking Habit				Total (n)	Total (%)	p-value	OR (95 % CI)
	Present (n)	(%)	Absent (n)	(%)				
Age group								
10 to 12	2	1,2	159	98,8	161	100,0	0,12 ⁽¹⁾	**
13 to 15	11	3,6	298	96,4	309	100,0		**
16 to 19	6	5,8	98	94,2	104	100,0		**
Schooling								
Elementary school	14	2,8	489	97,2	503	100,0	0,07 ⁽²⁾	1,00
High school	5	7,0	66	93,0	71	100,0		2,65 (0,92 to 7,58)
Delays in schooling								
None	3	1,3	223	98,7	226	100,0	0,04 ^{*(1)}	1,00
1 to 2 years	10	3,9	247	96,1	257	100,0		3,01 (0,82 to 1,07)
3 years or more	6	6,6	85	93,4	91	100,0		5,25 (1,28 to 1,45)
Gender								
Male	14	5,2	253	94,8	267	100,0	0,01 ^{*(1)}	3,34 (1,19 to 9,41)
Female	5	1,6	302	98,4	307	100,0		1,00
Do you have a religion?								
Yes	10	2,5	393	97,5	403	100,0	0,08 ⁽¹⁾	1,00
Do you work?								
No	14	2,8	488	97,2	502	100,0	0,18 ⁽²⁾	**
Yes, formally	-	-	4	100,0	4	100,0		**
Yes, informally	5	7,4	63	92,6	68	100,0		**
Yes	12	3,6	324	96,4	336	100,0	0,67 ⁽¹⁾	1,22 (0,47 to 3,15)
No	7	2,9	231	97,1	238	100,0		1,00
Alcohol use								
Yes	18	5,8	295	94,2	313	100,0	<0,00 ^{*(1)}	**
No	1	0,4	260	99,6	261	100,0		
Never	1	0,4	260	99,6	261	100,0	<0,00 ^{*(2)}	**
Use in lifetime	2	2,2	89	97,8	91	100,0		**
Use in previous year	3	2,6	114	97,4	117	100,0		**
Use in previous month	4	7,0	53	93,0	57	100,0		**
Frequent use	5	18,5	22	81,5	27	100,0		**
Heavy use	4	19,0	17	81,0	21	100,0		**
Total group	19	3,3	555	96,7	574	100,0		

(*): Significant association at 5.0% level; (**): Not possible to determine due to occurrence of null and very low frequencies; (1): Pearson's chi-squared test; (2): Fisher's exact test

Relationships with one's father ($p=0.01$) and mother ($p=0.00$) were also associated with smoking (Table 4).

Table 4. Association between smoking and relationship with one's parents and perception of parents' profile. Campina Grande-PB, 2011

Variable	Smoking habit				Total (n) (%)	p-value	OR (95 % CI)
	Present (n) (%)		Absent (n) (%)				
Relationship with father							
Good	12	2,4	483	97,6	495	100,0	0,01 ⁽¹⁾ **
Fair	6	9,0	61	91,0	67	100,0	**
Poor	1	8,3	11	91,7	12	100,0	**
Relationship with mother							
Good	14	2,7	513	97,3	527	100,0	0,00 ⁽¹⁾ **
Fair	3	7,3	38	92,7	41	100,0	**
Poor	2	33,3	4	66,7	6	100,0	**
Relationship between parents							
Do not live together	11	2,8	379	97,2	390	100,0	0,19 ⁽¹⁾ **
Good	4	6,9	54	93,1	58	100,0	**
Fair	1	8,3	11	91,7	12	100,0	**
Poor	3	2,6	111	97,4	114	100,0	**
Description of father							
Authoritarian	6	3,0	191	97,0	197	100,0	0,22 ⁽²⁾ **
Moderate	12	4,4	259	95,6	271	100,0	**
Liberal	1	0,9	105	99,1	106	100,0	**
Moderate	6	2,5	237	97,5	243	100,0	0,44 ⁽²⁾ 1,00
Liberal	4	2,9	132	97,1	136	100,0	1,20(0,33 to 4,3)
Authoritarian	9	4,6	186	95,4	195	100,0	1,91(0,67 to 5,4)
Total group	19	3,3	555	96,7	574	100,0	

(*): Significant association at 5.0% level; (**): Not possible to determine due to occurrence of very low frequencies; (1): Pearson's chi-squared test; (2): Fisher's exact test

DISCUSSION

Brazil is a large developing country covering 8,512,000 Km², with 200 million inhabitants. As in other countries, tobacco is the second most frequently consumed drug among adolescents and, together with alcohol, is a gateway substance for the use of illicit drugs (13,16).

A total of 574 schoolchildren participated in the present study and the prevalence of smoking was low (3.3 %), which corroborates findings described in previous studies (10,11), but is lower than the figure found in a large national study employing a similar methodology entitled Tobacco Surveillance in Schoolchildren (2004), which reports a prevalence value of 16 % (range: 9 to 27 %) (12). The prevalence in the present study is also lower than values reported in international studies [19 % (6) and 14.8 % (17)].

While the present study does not offer data that indicate a tendency toward a reduction in the prevalence of smoking among schoolchildren, the comparison with previous studies suggest such a decline in smoking in this

population. This may be the reflection of national anti-smoking policies and local actions involving restrictive measures, the prohibition of smoking in closed public and private environments and educational campaigns carried out at schools. Another important factor to consider is that the questionnaire was administered in the school setting, which increases the possibility of under-reporting smoking habits. However, the anonymity ensured by the self-administered questionnaire may have minimized this possibility.

The risk of disease and difficulty quitting are greater when smoking habits are acquired at an early age (18). The lowest age for initiating smoking in the present study was eight years and 44.3 % reported initiating smoking between 11 and 14 years of age. These findings reveal that schoolchildren begin smoking at an early age and underscore the need to intensify educational and prevention programs aimed at younger children. Previous studies report similar results (3,4). A number of factors favors smoking among young Brazilians, such as the low price of cigarettes, which is among the lowest in the world, and the easy access to tobacco products (19). The early starting age of smoking (90 % under 19 years of age) has led the WHO to classify smoking among pediatric diseases, requiring proper diagnosis, treatment and preventive measures (20).

Smoking has been identified as the major risk factor for the development of several diseases such as lung cancer, heart, circulatory, coronary and respiratory diseases, and sexual impotence in men (21). The number of cigarettes smoked per day is directly related to disease and mortality rates among smokers. Consumption of more than 1 pack per day (>20 cigarettes/day) is associated with a 13-fold increase in the risk of developing head and neck cancers, while the consumption of 1 to 20 cigarettes per day has been associated with an increased risk of stomach cancer (22). The majority of adolescents in the present study reported smoking between one and 10 cigarettes per day, which is similar to findings reported in previous studies (5,18). The amount of cigarettes consumed is also related to nicotine addiction. Although it was not within the scope of the present study to analyze the magnitude of this dependence, adolescents are more susceptible. After reaching the brain, nicotine binds to nicotine receptors. Activated receptors then stimulate the release of dopamine, a neurotransmitter associated with addiction (20).

Regarding the associations between smoking, age and school year reported by other authors (11,23), it was not possible to establish these associations in the present study. However, an association was found between delayed schooling and smoking ($p=0.04$), with a greater risk when students were

three or more years behind in their studies (OR=5.25). This behavioral aspect has been related to smoking habits over time and may be related to the socio-economic and environmental context, such as a lack of familial support (24).

While there has been a tendency toward an increase in smoking among women, who have been targeted by marketing campaigns of the tobacco industry (9), smoking was more prevalent among males in the present study ($p=0.01$).

It is presumed that practicing a religion places individuals within a group with shared values and norms, in which there is an explicit condemnation of overall drug use (25). However, no statistically significant association was found in the present study between religion and smoking ($p=0.08$). This finding may have been due to the fact that the participants were only asked whether they had a religion and not whether they practiced the religion. Officially belonging to a particular religion is frequently just a formality not likely to influence behavior (26).

All adolescents surveyed were enrolled in public schools, which denote an underprivileged economic status. Thus, the participants were asked if they held jobs to determine whether buying power exerted an influence over the practice of smoking. However, no significant association was found between these variables ($p=0.18$), which contrasts findings reported in previous studies (27,28).

The practice of sports is a source of pleasure and contributes toward the physical, emotional and social development of adolescents, helping them maintain a healthy lifestyle (29). The protective aspect of practicing sports likely reflects scenarios and characteristics that promote health as being different from those that facilitate smoking among adolescents (11). Nonetheless, no such association was found in the present investigation ($p=0.67$), as also reported in previous studies (18,30).

Tobacco and alcohol are two major human vices and the combination of both can have compound effects, such as in cases of cancers of the esophagus (31). In the present study, the majority of smokers also consumed alcohol ($p<0.00$). The combined use of these drugs has been reported in previous studies (31,32) and suggests a bidirectional relationship between smoking and alcohol use. Moreover, the majority of smokers made frequent or heavy use of alcohol ($p<0.00$), suggesting that the practice of smoking may be influenced by the intensity of alcohol use.

The presence of parents and brothers who smoke has been positively associated with smoking in adolescence. Likewise, parents' values and familial supervision are reported to be protective factors when not smoking is one of these values (33,34). Analyzing the family environment, having a fair or poor relationship with one's father or mother ($p=0.01$ and $p=0.00$, respectively) was associated with smoking. It is possible that the stress produced by strained parental relationships may induce adolescents to smoke. There are also reports in the literature that a strained relationship between one's mother and father and authoritarian attitudes in the household are positively associated with smoking (35,36). However, it was not possible to establish such associations in the present study. Further studies are needed to address this complex issue.

The different definitions used for the measurement of the outcome (smoking among adolescents) and different age groups addressed in the literature constitute methodological limitations. The present study employed the criteria determined by the WHO and used in a large Brazilian national study on monitoring tobacco use (16). Regarding the age group, the entire span of adolescence was included, as individuals in this phase in life are considered to be at greater risk for drug abuse. Another limitation of the present study was the impossibility of calculating odds ratios in many cases due to very low or null frequencies, which rendered a multivariate analysis impossible.

Factors associated with smoking can be modified over time and behavioral patterns may vary from population to population, between individuals and even within a single individual in different phases of life. Thus, the constant monitoring of smoking habits in population-based studies is necessary to the establishment of prevention programs and the assessment of existing programs, as new epidemiological data can challenge the efficacy of public policies. The Brazilian government adhered to the Framework Convention on Tobacco Control in 2005 and has adopted campaigns with a strong appeal toward reducing exposure to smoking (less advertising, the promotion of negative images of cigarettes, an increase in the price of cigarettes, etc.). Another important measure has been the establishment of reference centers for addressing and treating smokers in the public healthcare system, at which smokers can receive guidance and medication to assist them in giving up smoking. While it was not within the scope of the present study to assess the impact of such measures, there has been a clear reduction in smoking among adolescent schoolchildren over the years, which suggests the importance of these public policies aimed at combating tobacco use.

Despite the low prevalence, an early initiation into smoking was found, suggesting that educational campaigns should be directed at younger children. Alcohol use stood out among the variables studied, suggesting that smoking is influenced by both the use and intensity of use of this substance. It is hoped that the findings of the present study can contribute toward guiding public policies aimed at combating smoking ♦

REFERENCES

1. World Health Organization. Child and adolescent health and development. Geneva: WHO, 2007. [Internet]. Disponível em: <http://www.who.int/child-adolescent-health>. Acessado 2010 mai.
2. Nargiso JE, Becker SJ, Wolff JC, Uhl KM, Simon V, Spirito A, et al. Psychological, peer, and family influences on smoking among an adolescent psychiatric sample. *J Subst Abuse Treat*. 2012; 42(3):310-318.
3. Myers MG, Gwaltney CJ, Strong DR, Ramsey SE, Brown RA, Monti PM, et al. Adolescent first lapse following smoking cessation: Situation characteristics, precipitants and proximal influences. *Addict Behav*. 2011; 36(12):1253–1260.
4. Zanini RR, Moraes AB, Trindade ACA, Riboldi J, Medeiros LR. Smoking prevalence and associated factors among public high school students in Santa Maria, Rio Grande do Sul, Brazil, 2002. *Cad Saude Publica*. 2006; 22(8):1619-1627.
5. Mhamdi SE, Wolfcarious-Khiari G, Mhalla S, Salem KB, Soltani SM. Prevalence and predictors of smoking among adolescent schoolchildren in Monastir, Tunisia. *East Mediterr Health J*. 2011; 17(6):523-528.
6. Kandra KL, Goldstein AO, Proescholdbell S. Variables associated with these and susceptibility to tobacco use among North Carolina Adolescents: Results from the 2007 survey across the state High school students. *N C Med J*. 2011; 72(1):13-19.
7. Turner L, Mermelstein R, Flay B. Individual and contextual influences on adolescent smoking. *Ann N Y Acad Sci*. 2004; 1021:175-197.
8. Jayakrishnan R, Geetha S, Binukumar B, Sreekumar, Lekshmi K. Self-reported tobacco use, knowledge on tobacco legislation and tobacco hazards among adolescents in rural Kerala State. Original Research. 2011; 22(2):195-199.
9. Hallal ALC, Gotlieb SLD, Almeida LM, Casado L. Prevalence and factors associated with smoking in schoolchildren in southern Brazil. *Rev Saude Publica*. 2009; 43(5):779-88.
10. Barreto SM, Giatti L, Casado L, Moura L, Crespo C, Malta DC. Smoking exposure among schoolchildren in Brazil. *Cien Saude Colet*. 2010; 15(Supl. 2):3027-3034.
11. Silva LVER, Malbergier A, Stempluk VA, Andrade AG. Factors associated with alcohol and drug use among college students. *Rev Saude Publica*. 2006; 40(2):280-288.
12. Brasil. Instituto Nacional do Câncer. Secretaria de Vigilância em Saúde, Ministério da Saúde. VIGESCOLA: Vigilância do Tabagismo em Escolares. Dados e fatos de 17 cidades brasileiras, 2004. [Internet]. Disponível em: <http://www.inca.gov.br/vigescola/docs/vigescola/docs/vigescolafim1/pdf>. Acessado 2010 jan.
13. Instituto Brasileiro de Geografia e Estatística. Primeiros resultados do Censo 2010. [Internet]. Disponível em: <http://www.censo2010.ibge.gov.br/dadosdivulgados/index.php?uf=25>. Acessado 2010 mai.
14. Galduróz JCF, Noto AR, Fonseca A.M, Carlini EA. Fifth National Survey About Psychotropic Drug Use among Students of the Elementary and Secondary Education's Public School 27 in the Brazilian Capital - 2004. São Paulo: Department of Psychobiology and Brazilian Information Center on Psychotropic Drugs UNIFESP-CEBRID, 2005. Department of Psychobiology and Brazilian Information Center on Psychotropic Drugs UNIFESP-CEBRID, 2005.
15. Frankfort-Nachimias C, Nachimias D. Research methods in the social sciences. 4th. ed. London: Edward Arnold, 1992, 144p.

16. Brasil. Ministério da Saúde. Instituto Nacional de Câncer. Manual de Orientação para a comemoração do Dia Mundial sem Tabaco: Juventude livre do tabaco. Brasília: INCA, 2008. [Internet]. Disponível em: http://bvsmms.saude.gov.br/bvsm/publicacoes/manual_dia_mundial_sem_tabaco2008.pdf. Acessado 2012 mar.
17. Villalbí JR, Suelves JM, García-Continente X, Saltó E, Ariza C, Cabezas C. Cambios en la prevalencia del tabaquismo en los adolescentes en España. *Aten Primaria*. 2012; 44(1):36-42.
18. Fraga S, Ramos E, Barros H. Smoking and its associated factors in Portuguese adolescent students. *Rev Saude Publica*. 2006; 40(4):620-626.
19. Leitão Filho FS, Galduróz JCF, Noto AR, Nappo AS, Carlini EA, Nascimento AO, et al. Random sample survey on the prevalence of smoking in the major cities of Brazil. *J Bras Pneumol*. 2009; 35(12):1204-1211.
20. Prokhorov AV, Winickoff JP, Ahluwalia JS, Ossip-Klein D, Tanski S, Lando HA, et al. Youth Tobacco Use: A Global Perspective for Child Health Care Clinicians. *Pediatrics*. 2006; 118(3):890-903.
21. Deheinzelin D, Lourenço MT, da Costa CL, Younes RN. The level of nicotine dependence is an independent risk factor for cancer: a case control study. *Clinics*. 2005; 60(3):221-226.
22. Hoshiyama Y, Sasaba T. A case-control study of stomach cancer and its relation to diet, cigarettes, and alcohol consumption in Saitama Prefecture, Japan. *Cancer Cause Control*. 1992; 3(5):441-448.
23. Page RM, Piko BF, Balazs MA, Struk T. Social normative beliefs regarding cigarette smoking in Hungarian adolescents. *Pediatr Inter*. 2011; 53, 662–668.
24. Morin AJ, Rodriguez D, Fallu JS, Maiano C, Janosz M. Academic achievement and smoking initiation in adolescence: a general growth mixture analysis. *Addiction*. 2012; 107(4):819-828.
25. Gryczynski J, Ward BW. Social norms and the relationship between cigarette use and religiosity among adolescents in the United States. *Health Educ Behav*. 2011; 38(1):39-48.
26. Tavares BF, Beria JU, Lima MS. Factors associated with drug use among adolescent students in southern Brazil. *Rev Saude Publica*. 2004; 38(6):787-796.
27. Biswas AK, Sarkar J. Tobacco use among urban school boys of Paschim Midnapore, India. *J Pak Med Assoc*. 2010; 60(9):786-9.
28. Das S, Ghosh M, Sarkar M, Joardar S, Chatterjee R, Chatterjee S. Adolescents Speak: Why do we Smoke? *J Trop Pediatr*. 2011; 57(6):476-80.
29. Strong WB, Malina RM, Blimkie CJ, Daniels SR, Dishman RK, Gutin B, et al. Evidence based physical activity for school-age youth. *J Pediatr*. 2005; 146(6):732-737.
30. Vuori MT, Kannas LK, Villberg J, Ojala SK, Tynjälä JA, Välimaa RS. Is physical activity associated with low-risk health behaviours among 15-year-old adolescents in Finland? *Scand J Public Health*. 2012; 40(1):61-68.
31. Hurley LL, Taylor RE, Tizabi Y. Positive and Negative Effects of Alcohol and Nicotine and Their Interactions: A Mechanistic Review. *Neurotox Res*. 2012; 21(1):57-69.
32. Scherrer JF, Xian H, Pan H, Pergadia ML, Madden PA, Grant JD, et al. Parent, sibling and peer influences on smoking initiation, regular smoking and nicotine dependence. Results from a genetically informative design. *Addict Behav*. 2012; 37(3):240-247.
33. Malta DC, Mascarenhas MDM, Porto DL, Duarte EA, Sardinha LM, Barreto SM, et al. Prevalence of alcohol and drug consumption among adolescents: data analysis of the National Survey of School Health. *Rev Bras Epidemiol*. 2011; 14(1):136-146.
34. Piko BF, Balázs MA. Authoritative parenting style and adolescent smoking and drinking. *Addict Behav*. 2012; 37(3):353-6.
35. Wen X, Shenassa ED. Interaction Between Parenting and Neighborhood Quality on the Risk of Adolescent Regular Smoking. *Nicotine Tob Res*. 2012; 14(3):313-22.
36. Chang HY, Wu WC, Wu CC, Cheng JY, Hurg BS, Yen LL. The incidence of experimental smoking in schoolchildren: an 8-year follow-up of the child and adolescent behaviors in long-term evolution (CABLE) study. *BMC Public Health*. 2011; 3(11):844.