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Perceptions of adolescents regarding consequences of licit drug use to oral and general health

Monalisa da Nóbrega Cesarino Gomes[a], Marayza Alves Clementino[a], Ramon Targino Firmino[a], Gabriella Lima Arrais Ribeiro[a], Maria Betânia Lins Dantas Siqueira[a], Ana Flávia Granville-Garcia[a]

[a] University State of Paraíba, Campina Grande, PB, Brazil

Abstract

Objective: To determine the prevalence of tobacco smoking and alcohol use and perceptions regarding the harmful effects of these drugs on both oral health and general health, comparing adolescents who have experimented with such drugs to those who have not.

Methods: A cross-sectional study was carried out involving 574 adolescents at public schools in the city of Campina Grande, state of Paraíba, Brazil.

Results: The prevalence of smoking was 3.3% and 54.5% of the adolescents had experimented with alcohol. A total of 88% of smokers and non-smokers believed that smoking can have a negative effect on oral health ($P=0.526$), with dental caries the most cited condition (38.2%; $P=0.013$). The vast majority (93.6%) believed that smoking can cause health problems, with no significant difference found between smokers and non-smokers ($P=0.434$). Cancer was the most cited consequence (44.2%; $P=0.434$). Among the adolescents who made use of alcohol and those who did not, bad breath was the most cited oral health consequence of alcohol use (38.3%; $P=0.267$) and cirrhosis was the most cited consequence to general health (23.8%); alcohol users cited cirrhosis significantly more than non-users ($P=0.001$).

Conclusion: The prevalence of tobacco smoking was low, whereas the prevalence of alcohol use was high in the present sample. The adolescents interviewed generally demonstrated a lack of knowledge regarding the consequences of these drugs to general and oral health.

Keywords: Adolescent; oral health; smoking; alcohol

Percepção de adolescentes sobre as consequências do uso de drogas lícitas na saúde oral e geral

Resumo

Objetivo: Avaliar a prevalência de tabagismo e consumo etílico, bem como a autopercepção sobre os efeitos adversos na saúde bucal e geral, comparando os adolescentes que experimentaram ou não estas drogas.

Métodos: Foi um estudo transversal, no qual participaram 574 escolares de Campina Grande, PB.

Resultados: A prevalência de tabagismo foi de 3,3% e 54,5% dos adolescentes experimentou o álcool. Um percentual de 88% de fumantes e não fumantes acredita que o tabagismo pode prejudicar a saúde bucal ($P=0,526$) e a cárie dentária foi a patologia mais citada (38,2%; $P=0,013$). A maioria considerou que o tabagismo pode causar problemas a saúde geral (93,6%), sem diferença entre os adolescentes fumantes e não fumantes ($P=0,434$) e a doença mais citada foi o câncer (44,2%; $P=0,434$). Entre os estudantes que faziam ou não consumo etílico, o mau hálito foi o prejuízo à saúde bucal mais apontado em consequência ao álcool (38,3%; $P=0,267$). Em relação a saúde geral, a cirrose foi a doença mais citada (23,8%), sendo os etilistas os que mais apontaram esta doença ($P=0,001$).

Conclusão: A prevalência de tabagismo foi baixa, entretanto observou-se um alto consumo de álcool. No geral, há um desconhecimento sobre as consequências do consumo de drogas lícitas na saúde geral e bucal.

Palavras-chave: Adolescentes; saúde bucal; tabagismo; alcoolismo

Correspondence:
Ana Flávia Granville-Garcia
anaflaviagg@hotmail.com

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Introduction

Adolescence is a phase of human development characterized by biological, cognitive, emotional and social changes that are important to the determination of habits in adulthood [1]. This period spans the ages of 10 to 19 years and is characterized by certain attitudes, questioning, the need for self-affirmation, uncertainties, rebellion, the influence of peers and fashion, the striving for physical-psychological-social balance and extreme behavior. These aspects make adolescents vulnerable to risk behavior and the use of both illicit and licit (tobacco and alcohol) drugs [1-5].

The consequences of tobacco smoking constitute the second most common cause of death worldwide and account for the deaths of one out of every ten adults (5 million per year). According to the World Health Organization, if current patterns are maintained, smoking will be responsible for the deaths of 10 million people annually by the year 2020 [6]. Smoking has been identified as risk factor for the development of diseases such as lung cancer, heart, circulatory, coronary and respiratory diseases, nicotine addiction, periodontal disease and tooth loss as well as sexual impotence in men. It is also reported to be the direct cause of 30% of cancer cases [7-9]. Ninety percent of smokers become dependent on nicotine between five and 19 years of age [6].

A number of studies report the increasingly early use of alcohol [1,10,11]. The immediate sense of pleasure, feelings of freedom and the lowering of inhibitions provided by alcohol have proven to be powerfully alluring aspects for adolescents [12]. In the long term, different health conditions are related to the intake of alcoholic beverages, such as systemic arterial hypertension, obesity, stroke, polyneuropathy, dementia, seizures, oral cancer, gastrointestinal cancer, mental disorder, suicide, sexually transmitted diseases and domestic violence [1,4].

Smoking and alcohol use in adolescence are considered serious public health problems throughout the world and measures have been taken for the prevention and early control of these substances, especially tobacco [10,12,13]. Nonetheless, there is a lack of studies in the literature on the knowledge of adolescents regarding the possible health consequences of these drugs.

The aim of the present study was to determine the prevalence of tobacco smoking and alcohol use and perceptions regarding the harmful effects of these drugs on both oral health and general health, comparing adolescents who have experimented with such drugs to those who have not. The expectation is to contribute toward the drafting of educational policies aimed at preventing the use of these drugs in this population.

Methods

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

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 [14].

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 minimum sample was estimated to be 496 students, to which 20% was added to compensate for possible losses, totaling 596 students.

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 three previously calibrated researchers using a self-administered questionnaire employed in previous studies. 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 [15].

Alcohol intake was defined based on the following categories [12]:

- *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.

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 [16]. 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. 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 tobacco and alcohol use.

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 compare perceptions regarding the consequences to general and oral health between adolescents who have experimented with these drugs and those who have not. The level of significance set to 5%.

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 displays the characterization of the sample with regard to age, gender, schooling, tobacco use and alcohol use. The majority of the adolescents were between 13 to 15 years (53.8%), female (53.5%) and attended elementary school (87.6%). The prevalence of smokers was 3.3% and 54.5% had experimented with alcohol, 6.7% of whom made heavy use of this substance.

Table 1. Characterization of sample

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
Smoking habit		
Smoker	19	3.3
Ex-smoker	51	8.9
Non-smoker	504	87.8
Have you ever had an alcoholic beverage?		
Yes	313	54.5
No	261	45.5
Total	574	100.0
Frequency of alcohol use		
Use in lifetime	91	29.1
Use in previous year	117	37.4
Use in previous month	57	18.2
Frequent use	27	8.6
Heavy use	21	6.7
Total	313	100.0

The vast majority of participants believed that smoking can cause harm to oral health (88%, P=0.526). Dental caries was the most cited oral consequence (38.2%), with a significant difference detected between smokers and non-smokers (P=0.013). A total of 93.6% believed that smoking can cause harm to general health. The most common consequences cited were cancer (44.2%) and cardiopulmonary problems (43.6%). No statistically significant differences were found between smokers and non-smokers regarding these issues (Table 2).

The recognition that alcohol use can cause oral health problems was greater among those who had never experimented with this drug (P<0.010). Halitosis was the most cited oral consequence, with no significant differences between those who had experimented with this drug and those who had not (P=0.267). The vast majority (90.1%) believed that alcohol use can cause harm to general health, with a greater awareness among those who had never experimented with this drug (P<0.027). Cirrhosis was the most cited consequence of alcohol use (23.8%; P=0.001) (Table 3).

Discussion

Exposure to smoking in adolescence has numerous short-term, medium-term and long-term implications for wellbeing and health and is a predictor of use in adulthood. With regard to alcohol use, despite being illegal for minors, it is culturally accepted by society and advertising for this drug is prized for its quality and creativity, with adolescents and young adults considered a target population. Due to the accessibility of these two substances, tobacco and alcohol are the most consumed drugs in adolescence and may also lead to experimentation with illicit drugs [1,4,17].

The prevalence of tobacco smoking in the present study was 3.3%, which is lower than figures reported in national studies and the project entitled Tobacco Surveillance in Schoolchildren, with prevalence values ranging from 6.3 to 16% [1,6,18]. This finding may have been affected by the strong national campaigns carried out in recent years as well as at school itself, where anti-smoking posters are on display. The prevalence of alcohol use was much higher (54.5%), with 8.6% and 6.7% of the sample making frequent and heavy use of this substance, respectively. High alcohol consumption among adolescents is also reported in previous studies, with prevalence values ranging from 3.3% to 16.4% [1,4,10,11,19]. One cannot discount the possibility that the omission of educational preventive campaigns may have influenced this finding.

Table 2. Distribution of participants according to recognition of consequences of smoking to oral health and general health.

Variable	Smoking status		Total n (%)	*P*-value
	Smoker n (%)	Non-smoker n (%)		
Do you believe smoking can harm oral health?				
Yes	60 (85.7)	447 (88.3)	507 (88.0)	0.526[1]
No	10 (14.3)	59 (11.7)	69 (12.0)	
If yes, what are the consequences?				
– *Oral Cancer*				
Yes	2 (3.8)	51 (12.4)	53 (11.4)	0.063[2]
No	51 (96.2)	359 (87.6)	410 (88.6)	
– *Caries*				
Yes	12 (22.6)	165 (40.2)	177 (38.2)	0.013[1]
No	41 (77.4)	245 (59.8)	286 (61.8)	
– *Halitosis*				
Yes	16 (30.2)	93 (22.7)	109 (23.5)	0.226[1]
No	37 (69.8)	317 (77.3)	354 (76.5)	
– *Tooth loss*				
Yes	4 (7.5)	44 (10.7)	48 (10.4)	0.475[2]
No	49 (92.5)	366 (89.3)	415 (89.6)	
– *Gingival problems*				
Yes	2 (3.8)	13 (3.2)	15 (3.2)	0.816[1]
No	51 (96.2)	397 (96.8)	448 (96.8)	
Do you believe smoking can harm general health?				
Yes	64 (91.4)	475 (93.9)	539 (93.6)	0.434[1]
No	6 (8.6)	31 (6.1)	37 (6.4)	
If yes, what are the consequences?				
– *Cancer*				
Yes	23 (38.9)	198 (44.8)	221 (44.2)	0.390[1]
No	36 (61.1)	243 (55.2)	279 (55.8)	
– *Cardiopulmonary problems*				
Yes	22 (37.3)	196 (44.4)	218 (43.6)	0.298[1]
No	37 (62.7)	245 (55.6)	282 (56.4)	
Do you believe that smoking causes dependence?				
Yes	1 (1.7)	5 (1.1)	6 (1.2)	0.710[2]
No	58 (98.3)	436 (98.9)	494 (98.8)	
– *Pregnancy problems*				
Yes	0	3 (0.7)	3 (0.7)	0.526[2]
No	59 (100.0)	438 (99.3)	497 (99.3)	0.526[2]

[1] chi-squared test. [2] Fisher's exact test. * 5% significance level.

Adolescents generally have good overall health. However, this phase of life constitutes a risk factor regarding oral health problems due to changes in eating habits and the non-acceptance of adult supervision [3]. Considering the undisputable evidence of the harmful effects on smoking and alcohol use on both general and oral health and the fact that adolescents and young adults are large consumers of these substances, discussions on these issues are needed, especially to determine whether there are differences in the recognition of the consequences among smokers, drinkers and those who have no experience with these drugs.

The vast majority of adolescents reported that smoking can cause oral health problems (88%), with no significance differences found between smokers and non-smokers (P=0.526). Dental caries was the most cited oral consequence of smoking (38.2%), with a significance difference found between groups. There was a clear demonstration of insufficient knowledge on the causal factors of dental caries, despite the fact that this issue is addressed in the majority of educational and preventive dental campaigns. Halitosis was the second most cited consequence (28.5%), with no difference between smokers and non-smokers. These findings are in agreement with

Table 3. Distribution of participants according to recognition of consequences of alcohol use to oral health and general health.

Variable	Experience with alcoholic beverages			
	Yes n (%)	No n (%)	Total n (%)	*P*-value
Do you believe alcohol use can harm oral health?				
Yes	164 (52.6)	164 (63.3)	328 (57.4)	0.010[1]
No	148 (47.4)	95 (37.4)	243 (42.6)	
If yes, what are the consequences?				
– *Oral Cancer*				
Yes	0	6 (4.1)	6 (2.1)	0.016[2]
No	137 (100.0)	139 (95.9)	276 (97.9)	
– *Caries*				
Yes	16 (11.7)	27 (18.6)	43 (15.2)	0.105[1]
No	121 (88.3)	118 (81.4)	239 (84.8)	
– *Halitosis*				
Yes	57 (41.6)	51(35.2)	108 (38.3)	0.267[1]
No	80 (58.4)	94 (64.8)	174 (61.7)	
– *Tooth loss*				
Yes	6 (4.4)	4 (2.8)	10 (3.5)	0.463[2]
No	131 (95.6)	141 (97.2)	272 (96.5)	
– *Stained teeth*				
Yes	4 (2.9)	8 (5.5)	12 (4.3)	0.280[2]
No	133 (97.1)	137 (94.5)	270 (95.7)	
Do you believe alcohol use can harm general health?				
Yes	276 (87.6)	245 (93.2)	521 (90.1)	0.027[1]
No	39 (12.4)	18(12.8)	57(9.9)	
If yes, what are the consequences?				
– *Cancer*				
Yes	12 (4.8)	13 (5.9)	25 (5.3)	0.608[1]
No	237(95.2)	208 (94.1)	445 (94.7)	
– *Cirrhosis*				
Yes	74(29.7)	38 (17.2)	112 (23.8)	0.001[1]
No	175 (70.3)	183 (82.8)	358 (76.2)	
– *Neurological or psychological problems*				
Yes	33 (13.3)	28 (12.7)	61 (13.0)	0.851[1]
No	216 (86.7)	193 (87.3)	409 (87.0)	
– *Drug use*				
Yes	3 (1.2)	1 (0.5)	4 (0.9)	0.376[2]
No	246 (98.8)	220 (99.5)	466 (99.1)	

[1] chi-squared test. [2] Fisher's exact test. * 5% significance level.

those reported in previous studies [20-21]. Despite the fact that oral cancer has been the focus of educational and prevention campaigns aimed at combating tobacco smoking [9,22], a small percentage of participants (11.4%; *P*=0.063) cited this disease as a consequence of smoking. While smoking is also reported to be a risk factor for periodontal disease [7-8], only 3.2% (*P*=0.816) of the participants cited "gum problems" as a consequence of smoking. These data demonstrate the need for campaigns directed at this portion of the population addressing the adverse effects of smoking as well as an analysis of the effectiveness of existing campaigns.

The adolescents in the present study were also asked whether they believed that smoking can cause harm to general health and the vast majority answered affirmatively (93.6%), with no significant difference between smokers and non-smokers (*P*=0.434). The most cited health consequences of smoking were cancer (44.2%; *P*=0.390) and cardiopulmonary problems (43.6%; *P*=0.298), which are indeed strongly associated to this habit [7-9]. However, the participants in the present study generally demonstrated a worrisome lack of knowledge on these aspects. None of the smokers and only three of the non-smokers mentioned problems during pregnancy, which has been an issue of

special interest due to the growing epidemic of smoking among the female gender [9], with consequences to the child, such as retarded uterine growth and low birth weight [7,9].

A total of 57.4% of the participants responded that alcohol use has consequences for oral health, with a higher percentage of affirmative answers among those who had never experimented with this drug (63.3% x 52.6%; *P*=0.010). The lower percentage of affirmative answers in comparison to problems related to general health may be the consequence of a lack of educational and preventive dental campaigns related to alcohol use. The lack of awareness on this issue is demonstrated by the fact that halitosis was the most cited oral health consequence of alcohol use (38.3%; *P*=0.267). Moreover, the second most cited consequence was dental caries (15.2%; *P*=0.105), which further demonstrates a lack of knowledge on the causes of this oral health problem. Oral cancer was only cited by 2.1% of the participants and none of the individuals who had experimented with alcohol cited this disease. The risk of developing oral or pharyngeal cancer is fivefold greater among consumers of alcoholic beverages and tenfold greater among those who both drink and smoke [23]. Previous studies have confirmed the important role alcohol plays in the etiology of oral cancer and report the compound effects of alcohol and tobacco on the development of this disease [23-24].

The vast majority of the participants responded that alcohol causes harm to general health (90.1%), with no statistically significant difference between drinkers and non-drinkers (*P*=0.027). The most cited consequence was cirrhosis (29.1%; *P*<0.001). Those who had experimented with alcohol had a greater awareness of this problem, perhaps due to the fact that is the condition most commonly associated with alcohol among the general population. However, even with this awareness, the prevalence of alcohol use was high, with reports of binge drinking (four or more drinks on a single occasion by women or five or more drinks by men), which increases the risk of intoxication and the predisposition toward continued use and alcoholism in adulthood [7,10]. Frequent and heavy alcohol use is not uncommon in this age group [4]. Psychological and neurological problems were cited by 13% of the participants (*P*=0.851), which are indeed among the adverse effects associated with alcohol use [4,10].

The present study has limitations that should be addressed. Information bias may have occurred, as stigmas are attached to smoking and alcohol use. It is therefore possible that these habits were under-reported. However, the self-administered questionnaire with the assurance of anonymity may have minimized this possibility. Another aspect is the small number of previous studies on the recognition of health consequences stemming from smoking and alcohol use, which hampers the comparison of the results.

The increase in the prevalence of experimentation with drugs has become a serious problem in Brazil as well as other countries [1]. The Brazilian government adhered to the Framework Convention on Tobacco Control in 2005 and has adopted campaigns with a strong appeal for a reduction in exposure to tobacco smoking (less advertising, the promotion of negative images of cigarettes, an increase in the price of cigarettes, etc.) [22]. However, much remains to be done with regard to alcohol use, as this drug is culturally acceptable and often synonymous with social status [13]. This situation and the results of the present study underscore the need for health programs aimed at the health consequences of the use of these substances and combating the practice of such habits. In this context, the school setting is an important venue for the concretization of health promotion actions aimed at adolescents [17,22]. The task at hand for both schools and the healthcare sector is to overcome isolated practices and promote joint, inter-sector actions.

Conclusion

In the present study, the prevalence of smoking was low, but the prevalence of alcohol use was high. A general awareness of the harm to health stemming from these substances was demonstrated by the adolescents surveyed, but there was also a general lack of knowledge on the consequent adverse effects of the use of these licit drugs and a clear lack of knowledge on the consequences to oral health.

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