Original article

Opinion of adolescent school smokers about smoking cessation counseling and treatment in health services: a cross-sectional study, Goiás, Brazil, 2018*

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Abstract

Objective: *To know the opinion of adolescent school smokers about smoking cessation counseling and treatment, and to investigate whether negative opinion was associated with lack of motivation to stop smoking.* ***Methods:*** *This was a cross-sectional study carried out in Goiás state, Brazil, with an intentional sample of adolescent students, in 2018. Poisson regression was used.* ***Results:*** *One hundred and thirty adolescents took part. Most of them expressed a positive opinion on the three smoking cessation interventions surveyed: medical counseling (76.2%), dental counseling (70.0%), and smoking cessation treatment (66.2%). Negative opinions were more frequent among adolescents who were not motivated to stop smoking ($p<0.05$). Regression analyses revealed that lack of motivation to quit smoking was associated with a negative opinion about each intervention.* ***Conclusion:*** *The adolescents had a positive opinion about counseling and treatment for smoking cessation in health services. Negative opinion was associated with lack of motivation to quit smoking.*

Keywords: *Adolescent; Tobacco Use Disorder; Smoking Cessation; Smoking Prevention; Cross-Sectional Studies.*

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Introduction

Smoking cessation provides large and immediate benefits and, when there is adequate support, the odds of an attempt to stop smoking being successful increase.[1] In order for the global targets for the reduction of tobacco use and related deaths to be achieved, the availability of support to smokers who want to give up the habit needs to be increased urgently.[1]

> *Considering that tobacco smoking initiation generally occurs in adolescence, offering counseling to smokers in this stage of life is highly recommended.*

In Brazil, actions aimed at smoking cessation are promoted by the National Health System (SUS),[2] the treatment protocol of which recommends that health professionals provide patients with counseling, whether or not associated with drug therapy,[3] in turn considered to be a cost-effective strategy.[3,4] Apart from the medical area, it is recommendable that dental health professionals also act to promote smoking cessation, during routine care provision to patients.[5-7]

Considering that tobacco smoking initiation generally occurs in adolescence,[8-10] offering counseling to smokers in this stage of life is highly recommended. Despite provision of drug therapy for adolescents who want to stop smoking not being very much in evidence, it is an option to be considered.[3,11]

The treatment protocols indicate tobacco smoking counseling and treatment action strategies of recognized efficacy. [3,4] However, there can be barriers to approaching adolescent smokers with these strategies. Knowing their opinion about the provision of this support can contribute to designing a policy on tobacco smoking control among young people. There is, however, no evidence in the literature of research with this purpose.

The main objective of this study was to know the opinion of adolescent smokers about counseling and treatment for smoking cessation in medical and dental services. It also sought to investigate whether negative opinion is associated with lack of motivation to stop smoking.

Methods

This investigation is part of a larger cross-sectional study about tobacco smoking conducted by the authors in all Goiás Federal Institute (IFG) schools located in 13 of the state's municipalities in 2018.

The municipalities where the schools are located and their respective regions within the state were: (i) Goiânia (state capital), Inhumas, Aparecida de Goiânia and Senador Canedo, in the Goiânia metropolitan region; (ii) Anápolis, in the *Centro Goiano* region (BR-153 highway axis); (iii) Uruaçu, in the *Norte Goiano* region; (iv) Formosa, Luziânia, Águas Lindas de Goiás and Valparaíso de Goiás, in the *Entorno do Distrito Federal* region; (v) Goiás, in the *Noroeste Goiano* region; (vi) Jataí, in the *Sudoeste Goiano* region; and (vii) Itumbiara, in the *Sul Goiano* region.

The sample size was calculated using the online OpenEpi tool and the following parameters for calculating proportions: estimated population of IFH high school students in 2018, aged up to 19 years old (n=3,694); 5.9% expected frequency of current cigarette use (in the last 30 days) and 19.4% of cigarette experimentation, based on prevalence among Brazilian public school students aged 16 to 17 found by the National School Student Health Survey (PeNSE 2015);[12] 2% sample error; and 95% confidence interval. The minimum number estimated for the sample was 467 students for the 'current smoker' outcome and 1,068 for the 'tobacco use experimentation' outcome. With the aim of ensuring the sample size, all students aged up to 19 years old were invited to take part, thus characterizing a school census in the institution. The statistical power of the sample for comparisons between groups, in relation to the variables analyzed in this study, was tested *a posteriori*.

Only students who self-reported smoking were selected for this analysis. The inclusion criteria were: having smoked in the last 30 days; and having answered, either completely or partially, the questions intended for smokers.

The data were collected by means of a printed self-administered anonymous questionnaire, containing closed questions for smokers and non-smokers. This instrument was prepared based on a literature review and later assessed by a group of six female Ph.D. qualified researchers with experience of studies based on health questionnaire administration. The instrument was also pre-tested in a sample of 14 adolescents who were not part of the study's target population.

The questionnaire completion took approximately 20 minutes. Data collection was done at the beginning or end of classes, with the class teacher making a prior

announcement at that moment. In order to avoid response bias, the researcher responsible for data collection used two banners to present the study to the adolescents and to instruct them on filling in the questionnaire correctly. The first banner provided general and ethical information about the study, while the second banner was used to provide the students with explanations about the questionnaire: e.g., questions exclusively for smokers should be left blank if respondents did not consider themselves to be smokers.

The dependent variables consisted of the adolescents' opinion about three interventions: receiving counseling to stop smoking during a medical appointment (outcome 1); receiving counseling to stop smoking during a dental appointment (outcome 2); receiving treatment to stop smoking (outcome 3). These variables were assessed by the following question:

Do you think that the following situations would help you to stop smoking?

(i) Receiving counseling to stop smoking during a medical appointment.
(ii) Receiving counseling to stop smoking during a dental appointment.
(iii) Receiving treatment to stop smoking.

The answer categories for each question were 'Yes', 'Perhaps' or 'No'.

'Yes' and 'Perhaps' answers were classified as 'Positive opinion', while the answer 'No', was classified as 'Negative opinion'.

The main independent variable, 'motivation to stop smoking', was measured by the Motivation to Stop Smoking Scale (Motivation To Stop Scale [MTSS]).[13,14] This instrument was chosen because the theoretical referenced used by this study was the Behavior Change Theory originally entitled 'PRIME Theory of Human Motivation'.[15] According to this theory, the main elements of motivation for changing a given behavior include, apart from beliefs about what one should do, the desire and the intention to act in a specific way.[15]

The single-item MTSS scale measures the three main constructs of the theory regarding motivation to stop smoking[13,14] and consists of the following question:

Which of the following describes you?

(i) *I don't want to stop smoking.*
(ii) *I think I should stop smoking but don't really want to.*
(iii) *I want to stop smoking but haven't thought about when.*
(iv) *I REALLY want to stop smoking but I don't know when I will.*
(v) *I want to stop smoking and hope to soon.*
(vi) *I REALLY want to stop smoking and intend to in the next 3 months.*
(vii) *I REALLY want to stop smoking and intend to in the next month.*

The original scale in English was validated[13] and later the Dutch version was also validated.[14] For use in this study, the authors translated the original version into Portuguese, with the aid of Master of Linguistics who taught 'English Language' at one of the schools belonging to the institution studied.

Based on data distribution frequency, adolescents with moderate or strong desire to stop smoking (with or without intention) were grouped together as 'motivated', while those who did not have this motivation or were only aware of the need to stop, but with no desire or intention, were grouped together as 'unmotivated'.

The independent variables related to tobacco smoking were:

(i) Age when experimented smoking for the first time, in years: ⩾15 or ⩽14.
(ii) Reported frequency of cigarette consumption: 'Did not smoke daily' or 'Smoked daily'.
(iii) Level of knowledge reported by the adolescent about the effects of tobacco use on smokers' overall health and oral health, as well as level of knowledge about treatment available to help smoking cessation, assessed by means of three questions about *How do you rate your knowledge of*: (i) effects caused by cigarettes on the overall health of smokers; (ii) effects caused by cigarettes on the oral health of smokers; (iii) treatment available to help people to stop smoking.

The answer categories for each question about this knowledge were 'Excellent', 'Good', 'Average', 'Little' or 'None', dichotomized into 'high knowledge' (excellent and good) and 'low knowledge' (average, little and none).

Level of nicotine dependence was measured using the heaviness of smoking index.[16] Based on the scores obtained for this index, which can vary between 0 and 6, the adolescents were classified as having 'low dependence' (scores 0 to 2) or 'moderate or high dependence' (scores 3 to 6).

The independent sociodemographic variables were:
(i) Sex (female; male)
(ii) Age range (in years: 14-16; 17-19)
(iii) Self-reported race/skin color (white, brown, black, yellow or indigenous)

IBM SPSS (V.24) statistical software was used. Initially a descriptive analysis of the variables investigated was performed by calculating absolute and relative frequencies. Following this, Pearson's chi-square test and Poisson regression with robust estimation were applied to analyze association between the adolescents' opinion about the smoking cessation interventions and their motivation to stop smoking. These analyses were restricted to those who fully answered the questions for smokers (N=86).

Only independent variables statistically associated with the outcome ($p<0.05$) were kept in the adjusted regression model. Prevalence ratios (PR) and 95% confidence intervals (95%CI) were estimated. The 'reported knowledge' variable was used in the following way: for outcome 1, the model was adjusted by knowledge about the effects of tobacco smoking on overall health; for outcome 2, the model was adjusted by knowledge about the effects of tobacco smoking on oral health; and for outcome 3, the model was adjusted by knowledge about treatment to help smoking cessation.

The study project was approved by the Federal University of Goiás Research Ethics Committee (CEP/UFG), on June 27th 2017: Opinion No. 2.142.027. The protocol was subsequently approved by the Federal Institute of Goiás Research Ethics Committee (CEP/IFG), on March 22nd 2018: Protocol No. 2.556.510. The participants' rights to anonymity, confidentiality, and to stop participating at any time with no adverse effects whatsoever for them were ensured. All those who freely agreed to take part signed (i) a Free and Informed Consent or Assent form (the latter when they were under 18 years old). As the study only involved administering a questionnaire, the opinion given by CEP/UFG was favorable to not requiring parents/guardians of adolescents under 18 years to sign the Free and Informed Consent form. Formal permission was obtained from the administration of each school.

Results

Of the 3,043 students invited to take part in the study, 3,034 (99.7%) accepted and 824 (27.2%) of those that accepted reported having experimented cigarettes at least once in their lifetime, while 241 (7.9%) had smoked in the last 30 days and 50 (1.7%) smoked daily. Students were included in this analysis who had smoked in the last 30 days and who answered the questions for smokers (n=130).

Most of the participants were male (52.3%), of brown (415%) or black (23.8%) race/skin color, aged between 14-16 years old (54.6%). Having experimented cigarettes by 14 or less years of age was reported by half the adolescents, while daily cigarette use was reported by 37.7%. The majority of the school student smokers (65.4%) had a low level of nicotine dependence and 49.2% of the respondents were not motivated to stop smoking (Table 1).

Knowledge reported by the students about the effects of tobacco smoking on overall health and oral health was low, with levels of 33.1% and 50.8%, respectively. With regard to treatment available to help smoking cessation, 72.3% of the adolescents reported low knowledge (Table 1).

Positive opinion about provision of counseling on smoking cessation during medical appointments and dental appointments was found in 76.2% and 70.0% of cases, respectively. With regard to provision of treatment to stop smoking, positive opinion prevalence was 66.2% (Table 2).

The adolescents' opinion about each of the three of the interventions studied was found to be significantly associated with motivation to stop smoking. As such, higher proportions of negative opinion were found among unmotivated adolescents ($p<0.05$) (Figure 1).

The crude Poisson regression indicated significant association between negative opinion about each of the three types of intervention and lack of motivation to stop smoking, as well as association with reported knowledge. There was also significant association between negative opinion about medical and dental counseling and daily cigarette consumption frequency (Table 3).

In the adjusted model, negative opinion about receiving counseling during medical appointments was more frequent among adolescents who were unmotivated to stop smoking (PR=6.49 – 95%CI 1.50;28.26). Likewise, negative opinion about counseling during dental appointments was associated with demotivation (PR=2.35 – 95%CI 1.10;5.04). For both outcomes, the models were adjusted by knowledge and by cigarette consumption frequency (Table 4).

Association between the participants' opinion about receiving treatment to stop smoking and their motivation to stop smoking lost its statistical significance in the model adjusted for knowledge about treatment available to help with cessation. Low knowledge remained associated with negative opinion (PR=2.18 – 95%CI 1.32;3.58) (Table 4).

Post hoc calculation of sample power revealed that the study had 78.5% power to detect differences in the students' opinion about counseling in medical appointments, and 59.2% power in dental appointments, in relation to the 'level of motivation to stop smoking' explanatory variable. Sample power was 67.2% with regard to opinion about smoking cessation treatment.

Discussion

This study represents the first empirical approximation of the opinion of adolescent Brazilian smokers about smoking cessation as part of health service provision. The results indicate that the participants, especially those motivated to stop smoking, tend to consider as being positive provision of treatment, as well as counseling on smoking cessation during medical and dental appointments.

Notwithstanding, a considerable part of the participants stated that provision of interventions in health services would not help them to stop smoking. Disinterest in

Table 1 – Frequency distribution of the independent variables investigated among adolescent school student smokers (n=130), Goiás, 2018

Variables	n	%
Sex		
Female	62	47.7
Male	68	52.3
Race/skin color		
White	32	24.6
Black	31	23.8
Yellow	8	6.2
Brown	54	41.5
Indigenous	4	3.1
Not informed	1	0.8
Age (years)		
≤16	71	54.6
≥17	59	45.4
Age (years) when experimented smoking		
≥15	65	50.0
≤14	65	50.0
Cigarette smoking frequency		
Do not smoke daily	81	62.3
Smoke daily	49	37.7
Level of nicotine dependence		
Low	85	65.4
Moderate or high	5	3.8
Not informed	40	30.8
Motivation to stop smoking		
Motivated	46	35.4
Unmotivated	64	49.2
Not informed	20	15.4
Knowledge about effects of tobacco smoking on overall health		
High	87	66.9
Low	43	33.1
Knowledge about effects of tobacco smoking on oral health		
High	64	49.2
Low	66	50.8
Knowledge about treatment available to help stop smoking		
High	36	27.7
Low	94	72.3

Table 2 – Opinion of adolescent school student smokers (n=130) about interventions in health services to help smoking cessation, Goiás, 2018

Interventions	Opinion (n; %)		
	Would help to stop smoking	Perhaps	Would not help
Counseling during medical appointment	45; 34.6	54; 41.5	31; 23.8
Counseling during dental appointment	39; 30.0	52; 40.0	39; 30.0
Treatment to stop smoking	44; 33.8	42; 32.3	44; 33.8
	Positive (would help/perhaps)		Negative
Counseling during medical appointment	99; 76.2		31; 23.8
Counseling during dental appointment	91; 70.0		39; 30.0
Treatment to stop smoking	86; 66.2		44; 33.8

smoking cessation services has been found among Chinese,[17] Welsh[18] and United States[19] adolescents. The barriers indicated include lack of knowledge of the existence of such services and uncertainty as to what is offered,[17] and also whether the service is available for young people.[19]

Previous studies have emphasized the need to adapt smoking cessation services to their adolescent users.[17-21] Lack of empathy on the part of health professionals has been associated with negative opinion about these services, among young smokers, while positive opinions have been found when professionals were friendly and supportive.[18] United States adolescents who took part in a qualitative study with focal groups on smoking cessation thought it was important for health professionals to take an interest in them as people, and not just as smokers.[20]

Confidentiality also represents a real barrier for many young people when they perceive that by smoking they are doing something that their parents and teachers would probably condemn.[17] Smoking cessation services need to be sensitive to these concerns,[17] and their interventions should respect the challenges that adolescents face when trying to give up smoking, recognize their choice in taking the decision to stop, and providing confidential and non-judgmental support.[20,21]

An important differential in this study was the fact of addressing the view of adolescent smokers about smoking cessation counseling in dental services. Similarly, a study conducted in Malaysia found a positive attitude regarding provision of counseling to stop smoking by dentists, both among adolescents and adults.[22]

With regard to the adolescents' motivation to stop smoking, the results presented in this report corroborate the panorama given by the 'Global Youth Tobacco Survey', according to which the percentage of adolescent smokers who wanted to stop the habit was above 32.1% in all

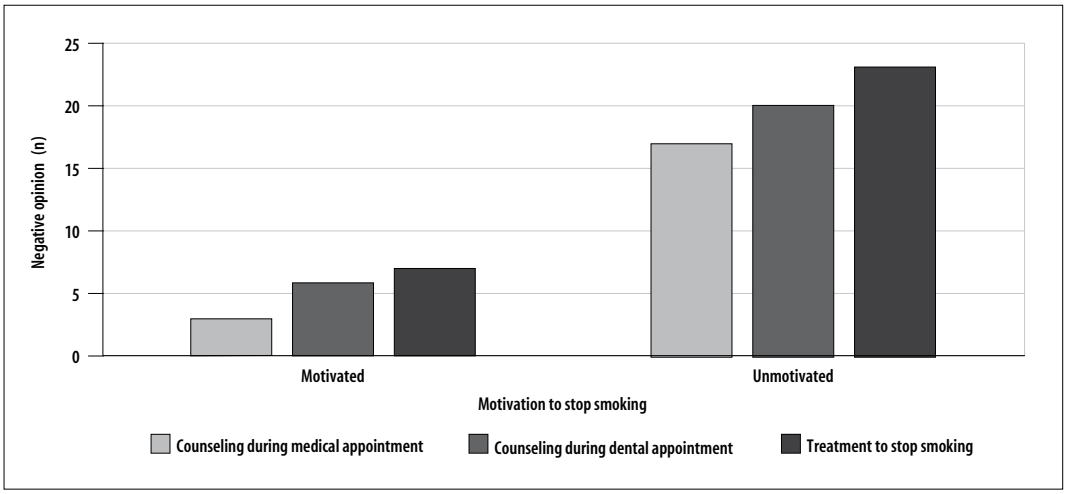

Figure 1 – Distribution of negative opinion about smoking cessation interventions studied among adolescent school student smokers (n=86) motivated or unmotivated to stop smoking, Goiás, 2018

Table 3 – Factors associated with negative opinion of adolescent school student smokers (n=86) about smoking cessation interventions, Goiás, 2018

Associated factors	Interventions					
	Counseling during medical appointment		Counseling during dental appointment		Treatment to stop smoking	
	Unadjusted PR[a] (95%CI[b])	p-value[c]	Unadjusted PR[a] (95%CI[b])	p-value[c]	Unadjusted PR[a] (95%CI[b])	p-value[c]
Motivation to stop smoking						
Unmotivated	3.88 (1.23;12.27)	0.021	2.29 (1.02;5.11)	0.044	2.25 (1.09;4.67)	0.029
Motivated	1.0		1.0		1.0	
Age (years)						
⩽16	1.70 (0.87;0.33)	0.206	1.72 (0.86;3.42)	0.122		
⩾17	1.0		1.0			
Age (years) when experimented smoking						
⩾15	0.60 (0.24;1.33)	0.195	0.59 (0.29;1.20)	0.146		
⩽14	1.0		1.0			
Knowledge reported						
High	2.52 (1.19;5.37)[d]	0.016	1.89 (1.01;3.54)[e]	0.048	2.20 (1.29;3.77)[f]	0.004
Low	1.0		1.0		1.0	
Cigarette smoking frequency						
Did not smoke daily	0.42 (0.17; 1.05)	0.065	0.38 (0.17; 0.85)	0.018		
Smoked daily	1.0		1.0			

a) PR: prevalence ratio.

b) 95%CI: 95% confidence interval.

c) P-value: Wald test.

d) Knowledge about effects of tobacco smoking on overall health.

e) Knowledge about effects of tobacco smoking on oral health.

f) Knowledge about treatment available to help smoking cessation.

Table 4 – Factors associated with negative opinion of adolescent school student smokers (n=86) about smoking cessation interventions, Goiás, 2018

Associated factors	Interventions					
	Counseling during medical appointment		Counseling during dental appointment		Treatment to stop smoking	
	Adjusted PR[a] (95%CI[b])	p-value[c]	RP[a] ajustada ($IC_{95\%}$[b])	p-valor[c]	RP[a] ajustada ($IC_{95\%}$[b])	p-valor[c]
Motivation to stop smoking						
Unmotivated	6.49 (1.50;28.26)	0.013	2.35 (1.10;5.04)	0.028	1.69 (0.81;3.53)	0.163
Motivated	1.0		1.0		1.0	
Knowledge reported						
High	3.20 (1.73;5.90)[d]	<0.001	2.11 (1.21;3.67)[e]	0.009	2.18 (1.32;3.58)[f]	0,006
Low	1.0		1.0		1.0	
Cigarette smoking frequency						
Did not smoke daily	0.45 (0.21;0.98)	0.046	0.41 (0.19;0.87)	0.021		
Smoked daily	1.0		1.0			

a) PR: prevalence ratio.

b) 95%CI: 95% confidence interval.

c) P-value: Wald test.

d) Knowledge about effects of tobacco smoking on overall health.

e) Knowledge about effects of tobacco smoking on oral health.

f) Knowledge about treatment available to help smoking cessation.

the countries surveyed between 2012 and 2015.[23] The percentage of adolescent school students in our study who did not want to stop smoking was also similar to the percentages found in studies that used the motivation to stop smoking scale with English[13] and Dutch[14] adults.

The findings of this study should be interpreted taking into consideration that the sample was comprised of high school students, enrolled in public schools in one single Brazilian state. National surveys with broader samples, including public and private school students can produce results more representative of the Brazilian adolescent population.

The low proportion of answers to the questions for smokers among adolescents who reported smoking cigarettes in the last 30 days could be considered to be a limitation of the study. However, only those who smoked in the last 30 days and considered themselves to be smokers should have answered the questions for smokers; in other words, not answering was a deliberate respondent decision. Despite it not having been an objective of the study to investigate the adolescents' smoking identity,[24] the results appear to reflect a phenomenon described in the literature as phantom smoking, found when a person uses cigarettes but does not yet identify as being as smoker.[25]

The variable with the lowest answer percentage was 'level of nicotine dependence', measured using the heaviness of smoking index, which contains questions about the amount of time since the first cigarette of the day and the amount of cigarettes smoked daily. That is to say, they are questions that do not apply to adolescents who have rarely smoked in their lifetime, but rather to those who use cigarettes with a certain regularity. Including only adolescents who answered all the questions for smokers was important for investigating, with due propriety, association between opinion about the interventions and motivation to stop smoking. It is noteworthy that 48 of the 50 students who reported smoking daily fully answered the questions for smokers.

Another criticism that could be made of the study refers to the relationship between the variables investigated. It seem obvious that adolescents unmotivated to stop smoking have a negative opinion about provision of counseling and treatment in health services for stopping smoking. However, the main objective of the study was to know the participants' opinion, while the use of the motivation scale brought an additional element to the analysis.

As this was the first study to use the MTSS scale in Brazil, in addition to having an adolescent population as its target, we recommend that the predictive value of the scale in Portuguese in relation to the 'smoking cessation' outcome be investigated. It should be highlighted that it was not the objective of this study to validate the instrument.

We conclude that the majority of adolescent smokers tended to consider that provision of counseling during medical or dental appointments, as well as treatment for smoking cessation, are actions that have the potential to help their attempts to stop smoking. Their opinion about provision of counseling in medical and dental services was associated with motivation to stop smoking, with knowledge of the harmful effects of smoking and with frequency of cigarette consumption. There was also association between their opinion about provision of treatment to stop smoking and motivation to shop smoking and knowledge about available smoking cessation treatment.

From the point of view of the adolescent smokers themselves, it is recommended that the availability of smoking cessation actions in Brazilian National Health System (SUS) medical and dental services should be scaled up, in order to drive forward attempts to stop smoking among this population group, in addition to investing in strategies to increase adolescents' motivation to give up smoking and to seek qualified help at health services.

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Authors' contributions

Rios LE contributed to the concept of the study, data acquisition, analysis and interpretation and drafting the article. Freire MCM collaborated with the concept and design of the study, data interpretation and critically reviewing the article. Both authors have approved the final version and declare that they are responsible for its contents.

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