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Института биологии и биотехнологии растений

NEWS

OF THE NATIONAL ACADEMY OF SCIENCES
OF THE REPUBLIC OF KAZAKHSTAN
of the Institute of Plant Biology and Biotechnology

**БИОЛОГИЯ ЖӘНЕ МЕДИЦИНА
СЕРИЯСЫ**



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БИОЛОГИЧЕСКАЯ И МЕДИЦИНСКАЯ



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**COMPARATIVE ANALYSIS OF FACTORS MOTIVATING
TOBACCO USE AMONG ADOLESCENTS
IN THE REPUBLIC OF KAZAKHSTAN**

Abstract. *Objectives.* The prevalence of tobacco use among schoolchildren continues to be a significant societal problem. A comprehensive study of personal and behavioral aspects of children and adolescents, and their impact on smoking is one of the most promising areas to address this issue. This study aimed to examine various conditions promoting the use of tobacco among children and adolescents.

Methods. The current study examined 1,715 eligible students, aged 13–15 years (grades 7–9) from the Global Youth Tobacco Survey (GYTS) conducted in Kazakhstan (2014). The GYTS is a school-based survey on tobacco use prevalence and key tobacco control measures among a representative sample. The survey has standardized methodology: a two-stage sample of schools and classes.

Results. Survey results indicated that 2.8% of schoolchildren smoked tobacco. Parental smoking (smoking by one or both parents) influenced smoking among their children. Furthermore, smoking youth demonstrated a positive image of tobacco use. Significant motivating factors included 1) helping to feel comfortable at parties, 2) a positive response to an offer to smoke from friends, and 3) hookah smoking.

Conclusions. Effective psycho-pedagogical educational technologies/programs are needed that target parents, especially those who smoke, as well as schoolchildren. These programs should be targeted at the family and school levels to develop negative attitude toward smoking and strengthen care for quitters. Additionally, strong legislative measures to create smoke-free environments and to reduce the availability of tobacco should be enacted.

Keywords: tobacco smoking, tobacco use, children, adolescent, behavioral risk factor, motivating factor.

Background. The prevalence of tobacco use among schoolchildren continues to be a significant societal problem. Rapid growth in the number of smokers has led to a "rejuvenation" of smoking and a decrease in the age of smoking initiation. Currently, the average age of young smokers is 13 years. Every day, approximately 80–100 thousand young people worldwide become addicted to tobacco [1–5].

The World Health Organization considers the health of young people through key indicators, including tobacco smoking. Regardless of the number of tobacco products consumed per day, teenagers who regularly smoke constitute a risk group, which, by the end of schooling, shows serious deviations in health status. The threat of increases in disease rates among children and adolescents has prompted the need for active implementation of effective and systematic mechanisms for monitoring the prevalence of tobacco smoking, and control, management, and identification of factors that increase the risk of tobacco smoking among the younger generation [1, 6–11].

Comprehensive study of personal and behavioral aspects, and their impact on smoking status among children and adolescents is a promising but insufficiently developed research area in the effort to reduce the incidence of smoking among youth [12–16]. Currently, there is a need to examine various conditions that prevent children and adolescents from using tobacco. In addition, there is a need to develop and implement measures to prevent smoking, by examining aspects of the individual's personality that lead to the initiation of smoking behavior. Thus, national representative studies in Kazakhstan on the prevalence of smoking among adolescents and systematic monitoring of key indicators of tobacco control are important and necessary steps toward the implementation of relevant policies and programs aimed at reducing tobacco smoking.

Methods. The Global Youth Tobacco Survey (GYTS) was administered among a representative sample of adolescents, aged 13–15, in 7 regions of the Republic of Kazakhstan, on the initiative of the World Health Organization, and through the coordination of the National Center for Problems of Healthy Lifestyle Development (2014). The GYTS, a component of the Global Tobacco Surveillance System (GTSS), is the international standard for the systematic monitoring of the prevalence of tobacco consumption (both smoking and smokeless) among young people and the monitoring of key indicators of tobacco control.

The GYTS uses a globally standardized methodology that includes a two-stage sample where the likelihood of choosing schools is proportional to the number of students in schools comprising students of the appropriate age range. Classes in selected schools are chosen at random, and all students in the selected classes have the right to participate in the survey. The survey uses a standard core questionnaire with a set of additional questions, which allows it to be adapted to meet the country's needs for information on tobacco use and on key indicators of tobacco control. Participants assent and the permission of their parents were obtained.

The study involved 2,083 students in grades 7–9, of which 1715 were 13–15 years of age. The current study presents results of a comparative assessment of motivating factors for smoking among both smokers and non-smokers.

Statistical processing of research materials was carried out using Excel and SPSS 15.0 for Windows. When analyzing the conjugacy tables, the Pearson chi-square criterion was used. This method makes it possible to evaluate the statistical significance of the differences in indicators of factors related to smoking among smokers and non-smokers. A binary logistic regression analysis of the predictors of smoking was performed and the odds ratio (OR) indicator was calculated.

Results. According to the results of the GYTS study, the prevalence of tobacco smoking among children aged 13–15 was 2.8% (girls = 3.5%, boys = 1.9%).

Investigation of the relationship of parental smoking showed that, one or both parents of smoking adolescents smoked more often (9.8%) than did parents of non-smoking adolescents (3.8%). Furthermore, "smoking only by the father" was noted by 39.0% of smoking adolescents, and in only 10.7% of non-smoking adolescents. Additionally, "smoking only by the mother" was observed in 14.2% of smokers and 12.9% of non-smokers. A Pearson's χ^2 comparison test points to the presence of statistically significant differences between the data of the two groups of adolescents ($\chi^2 = 38.9$, $df = 3$, $p < 0.001$; figure 1).

Children who smoke do not always fully understand the negative consequences of smoking on health. Awareness in children about the dangers of smoking is reflected in the distribution of answers to the question "Do you think that smoking tobacco harms your health?" Among the adolescents surveyed,

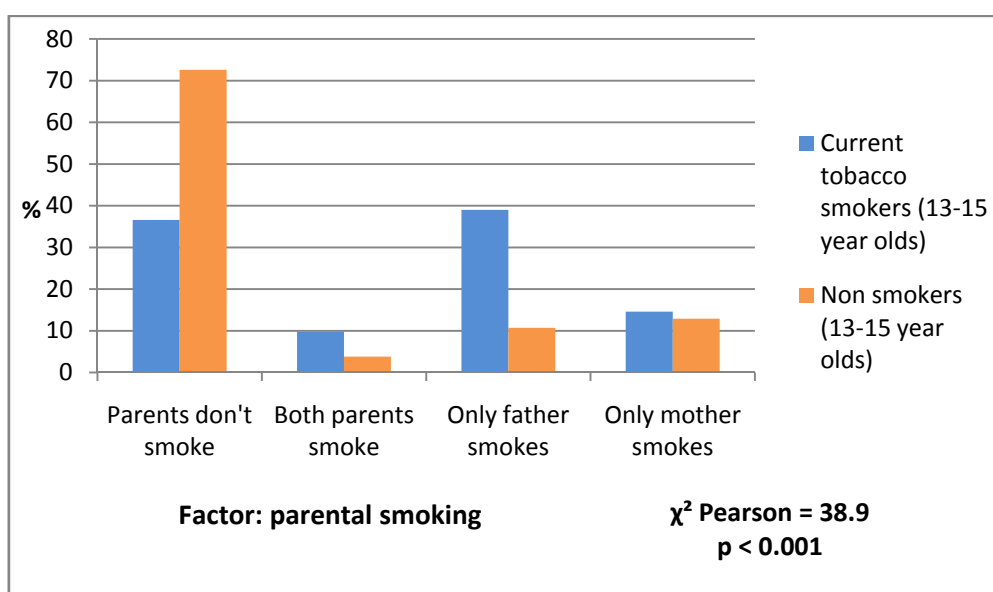


Figure 1 – Parental smoking and smoking status of adolescents

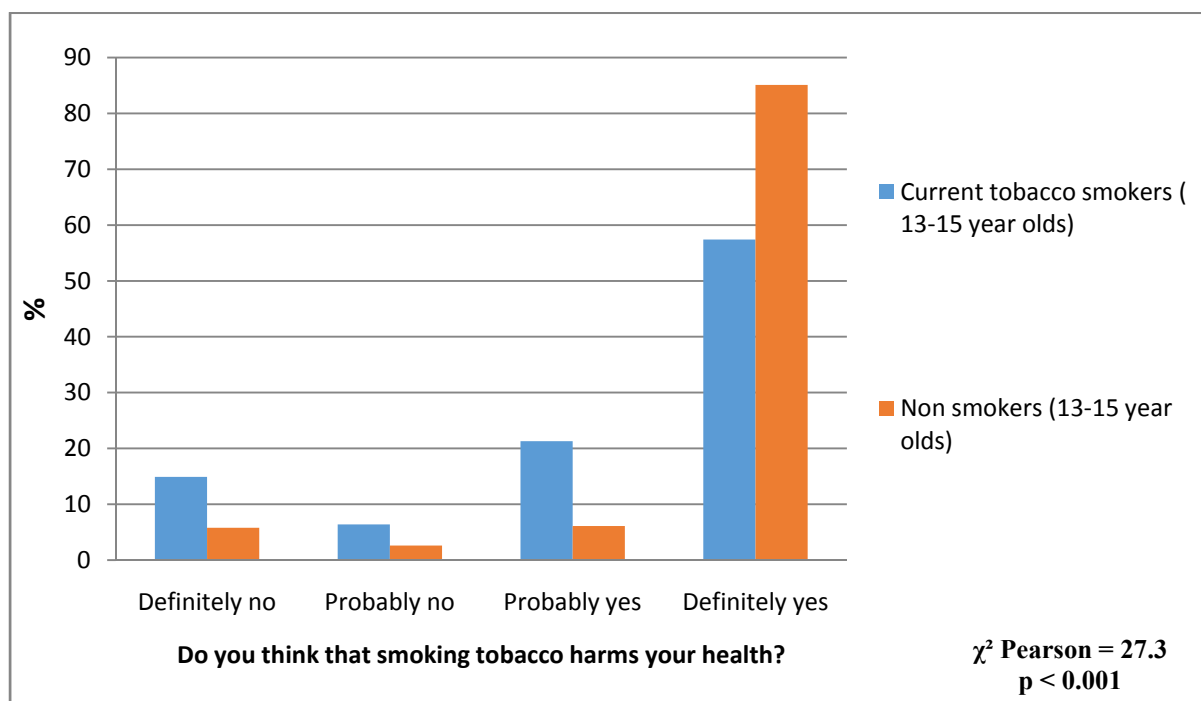


Figure 2 – Adolescents' awareness of the dangers of smoking

78.7% of smoking teenagers and 91.2% non-smokers answered that smoking is harmful to health ($\chi^2 = 27.4$, $df = 3$, $p < 0.001$; figure 2).

In the youth environment, behaviors such as curiosity, imitation of friends/parents, as well as the desire to appear as adults, independent, modern, and fashionable are common. Often, smoking is considered by youth as an indicator of the above "achievements." During this study, respondents' opinions were considered, specifically concerning how much smoking can affect communication. We asked if they believed that young people who smoke usually have more or less friends. Results indicated that adolescent smokers (39.1%) were significantly more likely to think smoking made it is easier to find friends. However, this opinion existed in only 10.2% of non-smoking teenagers ($\chi^2 = 44.2$, $df = 2$, $p < 0.001$).

We further examined the opinion of whether smoking makes young people more (or less) attractive. A total of 24.4% of smokers and 11.7% of non-smokers believed that smoking made an individual more attractive. Conversely, only 31.1% of teenage smokers noted that smoking lowers attractiveness, while more than half (54.3%) of non-smoking individuals held this belief. Statistical testing demonstrated a significant difference between these groups ($\chi^2 = 11.7$, $df = 2$, $p < 0.01$).

Nearly half of the smokers (43.5%) believed that smoking helps young people to feel more comfortable at public events, such as celebrations and parties, while non-smokers demonstrated this opinion four times less frequently (11.8%). It was noted that only 8.7% of smokers and 26.4% of non-smokers believed that smoking made an individual less comfortable at such events. Most non-smoking respondents (61.8%) answered that smoking has no effect on comfort, while fewer smokers (47.8%) agreed with this answer. Such misconceptions can lead to an increase in the prevalence of addictive behaviors in children and adolescents.

We asked whether respondents would agree to smoke if their best friend(s) offered the opportunity to smoke. A positive response was given by more than half (51.1%) of adolescents who smoked, but only by 2.8% of non-smokers.

According to the data of our study, 52.2% of smoking adolescents also reported hookah smoking, compared to only 7.8% of non-smoking adolescents. These differences were statistically significant ($\chi^2 = 106.5$, $df = 1$, $p < 0.001$).

The prevalence of smokeless tobacco consumption among teenagers was 0.6% (95% CI 0.3–1.3). Similar to the results for hookah smoking, the number of children using nasvay (chewing tobacco)

(13.0%) was significantly higher in the group of tobacco smokers (among non-smokers, the figure was 3.7%).

To more accurately identify the relationship between adolescent smoking and motivating factors (predictors), binary logistic regression models were used and ORs were calculated. To form dichotomous data, a combination of similar variables or an exception of independent variables was carried out. Specifically, two statistical approaches were used. First, all eight factors were included in the regression model to determine the strongest predictors (table 1). Then, a model of step-by step inclusion of the most significant predictors was built.

Table 1 – Logistic regression of predictors of smoking among children aged 13–15 by the Enter method

		Regression coefficient (B)	Standard error (S.E.)	Wald	(df)	Significance (Sig.)	Exp (B)
(Step) 1	Factor – parental smoking	1,037	1,023	1,027	1	0,311	2,821
	Opinion about the dangers of smoking	0,555	1,093	0,258	1	0,611	1,742
	Opinion on the influence of smoking on the number of friends	0,222	1,093	0,041	1	0,839	1,249
	Opinion about the influence of smoking on attractiveness	-0,628	1,089	0,333	1	0,564	0,533
	Belief that smoking makes one feel comfortable at parties	3,182	1,450	4,815	1	0,028	24,098
	Positive response to offer to smoke from friends	2,598	1,051	6,114	1	0,013	13,441
	Hookah smoking	1,673	1,030	2,638	1	0,104	5,326
	Nasvay use	1,575	1,264	1,553	1	0,213	4,831
	Constant	-17,061	5,126	11,078	1	0,001	0,000

The results of binary logistic regression modeling showed statistically significant associations with smoking among children and the following predictors: smoking helps me feel more comfortable at parties; a positive response to a proposal to smoke from friends; and hookah smoking (table 2).

The ORs for each motivating factor are presented in table 3. Each of the separately examined factors (predictors) played a role in motivation for smoking. Similar to the results of the regression, the most significant factors associated with adolescent smoking initiation were that smoking helps individuals to

Table 2 – Logistic regression of predictors of smoking among children aged 13–15 by the Forward Conditional method

		Regression coefficient (B)	Standard error (S.E.)	Wald	(df)	Significance (Sig.)	Exp (B)
(Step) 1(a)	Positive response to offer to smoke from friends	3,750	0,773	23,547	1	0,000	42,500
	Constant	-7,163	2,025	12,505	1	0,000	0,001
(Step) 2(b)	Belief that smoking makes one feel comfortable at parties	2,405	1,110	4,691	1	0,030	11,078
	Positive response to offer to smoke from friends	3,146	0,819	14,751	1	0,000	23,239
(Step) 3(c)	Constant	-8,798	2,387	13,583	1	0,000	0,000
	Belief that smoking makes one feel comfortable at parties	2,362	1,150	4,218	1	0,040	10,611
	Positive response to offer to smoke from friends	3,272	0,869	14,166	1	0,000	26,370
	Hookah smoking	1,930	0,876	4,850	1	0,028	6,887
	Constant	-12,420	3,300	14,162	1	0,000	0,000

a – Variable entered on step 1: Positive response to offer to smoke from friends.
b – Variable entered on step 2: Does smoking make you feel comfortable at parties?
c – Variable entered on step 3: Hookah smoking.

Table 3 – Odds ratio for smoking: motivating factors

		Current tobacco smokers (children 13–15-year-olds), %	Non-smokers (children 13–15-year-olds), %	Odds ratio (95% CI) Probability of error
Parental smoking	One or both parents smoke	63,4	27,4	4,6 (2,4–8,8) p<0,001
	Parents do not smoke	36,6	72,6	
Opinion of children about the dangers of smoking	No harm	21,3	8,4	2,9 (1,4–6,0) p<0,01
	Does harm	78,7	91,6	
The opinion of children about the effect of smoking on the number of friends	Smokers have more friends	78,3	19,7	14,7 (5,4–40,1) p<0,001
	Smokers have less friends	21,7	80,3	
The opinion of children about the influence of smoking on attractiveness	Smoking makes people more attractive	44,0	17,7	3,7 (1,6–8,2) p<0,01
	Smoking makes people less attractive	56,0	82,3	
Children's belief that smoking helps people feel more comfortable at parties	More comfortable	83,3	30,9	11,2 (3,8–33,1) p<0,01
	Less comfortable	16,7	69,1	
Response to best friends offering tobacco product	Positive	51,1	2,9	35,3 (18,6–67,1) p<0,001
	Negative	48,9	97,1	
Hookah smoking	Yes	52,2	7,8	12,9 (7,0–23,6) p<0,001
	No	47,8	92,2	
Nasvay use	Yes	13,0	3,7	3,9 (1,6–9,5) p<0,01
	No	87,0	96,3	

feel comfortable at parties, a positive response to use a tobacco product if offered by best friends, and hookah smoking. Factors with the lowest ORs were awareness in children about the dangers of smoking (i.e., knowledge of the harm that smoking inflicts does not influence involvement in tobacco smoking), the association between smoking and the attractiveness of a person, and nasvay use.

Discussion. Because smoking was, and remains, one of the most common behavioral risk factors affecting a large part of the youth population, it is important to study the causes and motivating factors of this high level of early tobacco use. Despite strict laws and anti-smoking programs, the problem of tobacco use among children and adolescents remains.

As our research and studies of other scientists show, among the factors predisposing individuals to smoking, social factors (e.g., environment, parents' example, awareness) play a leading role [7, 8]. For various reasons, children and adolescents easily would use a tobacco product if it was offered by their best friends.

Often among teenagers, false ideas (i.e., myths) about smoking can be propagated. The current results indicate the development of several incorrect beliefs about tobacco use, such as "young people who smoke usually have more friends," "smoking helps young people feel more comfortable at parties," etc. Knowledge about the negative impact of tobacco on health among adolescents who smoke is insufficient and fragmentary. Unfortunately, this dearth of adequate information leads to a lack of formation of positive motivations for not initiating or quitting smoking.

A comparative evaluation of two groups (i.e., smokers and non-smokers) showed that smokers were significantly more likely to have parents who smoked (one or both parents smoking). Furthermore, children who used tobacco were more likely to report that smoking does not harm health and that young people who smoke usually have more friends. Additionally, smoking teens were much more likely to believe that smoking makes young people more attractive, helps them feel more comfortable at parties and other similar events, and were more likely to freely agree to smoke when it was suggested by friends. Moreover, smoking hookah and the use of nasvay were significantly more common among adolescent tobacco smokers. Finally, the most important factors motivating smoking among children and adolescents

were 1) smoking helps individuals feel comfortable at parties; 2) a positive response to an offer to smoke from friends, and 3) hookah smoking.

Conclusions. The findings of this study reveal the need for effective psychological, pedagogical, and educational technologies in addition to legislative measures, when developing primary and secondary smoking prevention measures for children and adolescents. In addition, these measures should be aimed at the level of schools and families, and families with parental smoking should be targeted.

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ҚАЗАҚСТАН РЕСПУБЛИКАСЫНДА ЖАСӨСПІРІМДЕР АРАСЫНДА ТЕМЕКІНІ ТҰТЫНУҒА ЫНТАЛАНДЫРАТЫН ФАКТОРЛАРДЫ САЛЫСТЫРМАЛЫ ТАЛДАУ

Аннотация. *Кіріспе.* Оқушылар арасында темекіні тұтынудың таралуы қоғамдағы жетекші әлеуметтік маңызды мәселелердің бірі болып қалуда. Балалар мен жасөспірімдер арасында тұлғалық және мінез-құлықтық аспектілер және олардың темекі шегуге ықпалын жан-жақты зерттеу өскең ұрпақ арасында темекі шегу жиілігін төмендету жөніндегі шаралар жүйесінде үміті зор бағыттардың бірі болып табылады. Аталған зерттеуде балалар мен жасөспірімдер арасында темекіні тұтынуға ықпал ететін факторлар қатары зерттелуде.

Әдістер. Зерттеуге Қазақстанда (2014 жылы) өткізілген Жастарды темекіні тұтыну бойынша ғаламдық зерттеу (Global youth tobacco survey, GYTS) шеңберінде 13-15 жастағы (жалпы білім беретін мектептердің 7-9 сыныптары) 1715 оқушы қамтылды. GYTS темекіні тұтынудың таралуы туралы мектеп сауалнамасын және қайталап таныстырмалы іріктеме арасында темекіге қарсы күрестің негізгі шараларын көрсетеді. Зерттеудің негізіне мектептер мен сыныптарды екі сатылы іріктеуді қамтитын стандартталған әдістеме жатады.

Нәтижелері. Сауалнама нәтижелері оқушылардың 2,8%-ы темекі шеккенін көрсеткен. Ата-ананың біреуінің немесе екеуінің темекі шегуі балалар арасында темекі шегуге ықпал еткен. Сонымен қатар, темекі шегетін жастар темекі тұтынудың жағымды бейнесін көрсеткен. Темекі шегуді ынталандыратын факторлар бар: 1) темекі шегу кештерде өзіңді жайлы сезінуге көмектеседі 2) достардан темекі шегуге ұсыныстан оң жауап алу және 3) қорқор тарту.

Қорытынды. Ата-аналарға, әсіресе темекі шегетін ата-аналарға, сондай-ақ оқушыларға арналған тиімді психологиялық-педагогикалық оқыту технологиялары/бағдарламалар қажет. Бұл бағдарламалар темекіге кері көзқарасты дамыту және темекіні тастағысы келетіндерге көмекті күшейту үшін отбасы және мектеп деңгейіне бағдарлануы қажет. Сонымен қатар, түгінсіз ортаны құру мен темекіге қолжетімділікті төмендету жөніндегі шешуші заңнамалық шараларды қабылдау қажет.

Түйін сөздер: шылымқорлық, балалар, жасөспірімдер, мінез-құлықтық қауіпті факторлар, ынталандырушы факторлар.

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СРАВНИТЕЛЬНЫЙ АНАЛИЗ ФАКТОРОВ, МОТИВИРУЮЩИХ К ПОТРЕБЛЕНИЮ ТАБАКА СРЕДИ ПОДРОСТКОВ В РЕСПУБЛИКЕ КАЗАХСТАН

Аннотация. *Введение.* Распространенность употребления табака среди школьников продолжает оставаться одной из ведущих социально значимых проблем общества. Всестороннее изучение личностных и поведенческих аспектов и их влияния на статус курения среди детей и подростков является одним из наиболее перспективных направлений в системе мер по снижению частоты курения среди подрастающего поколения. В данном исследовании изучаются ряд факторов, способствующих употреблению табака среди детей и подростков.

Методы. В исследование было включено 1715 школьников в возрасте 13-15 лет (7–9-ые классы общеобразовательных школ) в рамках Глобального обследования молодежи по потреблению табака (Global youth tobacco survey, GYTS), проведенного в Казахстане (2014 год). GYTS представляет собой школьный опрос о распространенности употребления табака и ключевых мерах борьбы против табака среди репрезентативной выборки. В основе исследования лежит стандартизированная методология, которая включает в себя двухступенчатую выборку школ и классов.

Результаты. Результаты опроса показали, что 2,8% школьников курили табак. Курение одного или обоих родителей влияло на курение среди детей. Кроме того, курящая молодежь демонстрировала поло-

жительный образ употребления табака. Существенные мотивирующие факторы курения включали: 1) курение помогает чувствовать себя комфортнее на вечеринках 2) положительный ответ на предложение покурить от друзей и 3) курение кальяна.

Выводы. Необходимы эффективные психолого-педагогические образовательные технологии / программы, предназначенные для родителей, особенно для тех, кто курит, а также школьников. Эти программы должны быть ориентированы на семейный и школьный уровни для развития негативного отношения к курению и усиления помощи желающим бросить курить. Кроме того, следует принять решительные законодательные меры по созданию бездымной среды и снижению доступности табака.

Ключевые слова: табакокурение, дети, подростки, поведенческие факторы риска, мотивирующие факторы.

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