Risk factors associated with Adolescents Smoking in Mongolia

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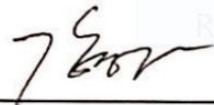Directed by Professor Young Ae Kang

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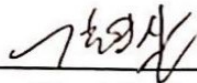
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CONTENTS

LIST OF TABLES

LIST OF FIGURES

LIST OF ABBREVIATION

CI	Confidence Interval
CDC	Center for Disease Control and Prevention
GSHS	Global School-Based Student Health Survey
MOH	Ministry of Health
MCA	Millennium Challenge Account
NCD	Non-Communicable Disease
NCPH	National Center for Public Health
NSO	National Statistical Office
SISS	Social Indicator Sample Survey
UN	United Nations
UNESCO	United Nations Educational, Scientific and Cultural Organization
UNAIDS	United Nations Program on HIV/AIDS
UNICEF	United Nations Children's Fund
US	United States
WHO	World Health Organization
WPRO	Western Pacific Regional Office

ABSTRACT

Introduction: Based on a large national dataset, we conducted an investigation to identify the risk factors associated with adolescent smoking.

Methods: Pooled cross-sectional data from the Global School-based Student Health Survey (2013) were analyzed, which consists of 5393 adolescence (11-18 years) students in the country. Bivariate and multivariate analyses were performed to identify the risk factors for current smoking in adolescents.

Results: A total of 5393 school adolescents participated in the survey and an overall response rate was 88%.

A total of 5322 adolescence students completed usable questionnaires for current smoking. The prevalence of current smoking was 8.4% (451 students). Among the male, 68.7% (310) were current smokers and female, current smokers were 31.2% (141). However, the majority, 57.9% (3084) were aged 13-15, 30% (1599) was 16 years older. The current smoker in the majority age, 16-18 were 59.2% (267), and between aged 13-15 were 38.3% (173). The risk factors for the current smokers were higher than the non-smokers. Being physical fights (72.7% vs 2.5, $P< 0.001$), Parents smoking (53.8% vs 4.2%, $P< 0.001$), Ever smoking (50.7% vs 4.5%, $P< 0.001$), Drinking alcohol (47.4% vs 4.6%, $P< 0.001$), Being physical attacked (47% vs 4.9%, $P< 0.001$), Being bullied (32.5% vs 5.8%, $P< 0.001$), Parents did not understand their problem (18.6% vs 7.5%, $P< 0.001$) and using drug (16.7 vs 8.5%, $P< 0.001$).

A total of 5262 (97.5%) adolescence students completed usable questionnaires for the ever smoking. The prevalence of ever-smoking was 23.2% and 1224 adolescence students reported they have at some point smoked a cigarette before age 14 years.

Among the 46.5% (2440) male, 59.7% (731) was ever smokers. Of the 53.4% (2802) female, ever smokers were 28.9% (354). The ever smoker aged between 16-18 was 43.1% (528). Similarly to older-aged adolescents, the ever smoker among 13-15 ages ever smokers were 42.4% (520) and the never smoker was 47.7% (2501).

The higher risk factor was found in ever smokers student. Being physical fights (56.2% vs 9.8, P<0.001), Parents smoking (45.2% vs 13.2%, P< 0.001), Current smoking (36.8% vs 15.7, P<0.001), Being physical attacked (36.1% vs 16.1%, P<0.001), Being bullied (29% vs 16.8%, P<0.001) and Drinking alcohol (25% vs 18.8%, P<0.001).

However, the risk factor for ever-smoking related to lack of parents understands their problem was lower than never smokers (18.5% vs 21.1%, P<0.001) and Using drugs (2.8% vs 25.9%, P<0.001) as well.

In a bivariate model, the adolescents in the 'current smoker' had high increased odds of drinking alcohol (OR 10, 95% CI 8.49-11.9), using drugs (OR 5.48, 95% CI 2.89-10.3) and increased odds of age, years (OR 2.66, 95% CI 2.26-3.14), being physical fights (OR 2.53, 95% CI 2.11-3.03), gender (male) (OR 1.95, 95% CI 1.66-2.32), being physically attacked (OR 1.61, 95% CI 1.36-1.92), lack of parents understanding their problems (OR 1.47, 95% CI 1.22- 1.78), parents use of tobacco (OR 1.31, 95% CI 1.12-1.53) and being bullied (OR 1.09, 95% CI 0.91to 1.30) as well.

In the further study, the multivariable analysis showed that current adolescents smoking were highly likely to be associated with drinking alcohol (OR 10.5, 95% CI 7.96-13.8), lack of parents understand their problem (OR 6.78, 95% CI 6.61-8.18), using drugs (OR 6.54, 95% CI 2.55-16.7), and high associated with age(years) (OR 3.10, 95% CI 2.49-3.85), gender (male) (OR 2.86, 95% CI 2.45-3.85), being physical fights (OR 2.71, 95% CI 2.03-3.63), being physically attacked (OR 1.57, 95% CI 1.19-2.07), parents use of tobacco (OR 1.32, 95% CI 1.03-1.60), and being bullied (OR 1.21, 95% CI 0.87-1.68).

Conclusion: Among the control variables, age, gender, being bullied, frequency of getting into physical fights, being physically attacked, drinking alcohol, using drugs, lack of parents understand their problem and parents smoking were significantly related to the higher frequency of smoking.

The current smokers in the majority age, 16-18 were 59.2%, and those who ever smoked were aged between 16-18 which was about 43.1%.

The study identified a number of risk factors among current smoking and those who ever smoked before the age of 14 years. High-risk factors identified for current smokers and among those who ever smoked include; physical fights, parental smoking, parents understand their problem, bullying, having been physically attacked using drugs and drinking alcohol.

The factors among the ever smoking students that were not necessarily high-risk factors were using drugs.

The study suggested that we have to develop a school health program and organize a social community team that including their parents' particular focus on young adolescents, as smoking is often initiated early. School-based health programs should be including which take the high-risk factors associated with current smoking and ever smoking among school-going adolescents in Mongolia into consideration. Finally, we need in a long-term study, it is advisable to examine the various factors and their sensitivity to the causes of smoking.

Key words: adolescents, current smoking, Mongolia, school based health survey.

INTRODUCTION

Background

About more than seven million people die annually worldwide due to tobacco and it is one of the biggest public health concerns in the present day. Seven million deaths result from direct tobacco smoking and approximately 1.2 million are being exposed to second-hand smoke. While adult smoking prevalence has been on the downward trend in developed countries, we have seen a significant increase in the smoking prevalence among low and middle-income countries. The burden of tobacco-related illness and death is heaviest in low and middle-income countries where about eighty percent of the one billion smokers around the world live [1]. By 2030, It is estimated that the number of tobacco-related deaths will increase to 8 million each year.

Of concern, 250 million children and adolescents mostly in developing countries are expected to die from tobacco-related causes [2].
Children are more vulnerable to tobacco exposure and this has more effect on their health. Adolescent smoking increases the likelihood of acute health problems, including respiratory illness, asthma, decreased fitness, reduced pulmonary function, and delayed lung development.

The severe adverse impact of exposure to tobacco smoke on children was brought to light by WHO in a 2001 report dedicated to tobacco and the rights of the child. Also, WHO stressed that there was no safe level of exposure to environmental tobacco smoke and that the negative effect of exposure on children was two-fold. Therefore, smoking behavior among children has important implications in two aspects.
First, exposure to tobacco smoke may seriously harm the health of a child. Second, it may drive a child to later engage in smoking behavior. Adolescent smoking has several common global determinants. One of the most important and universal factors is the role of parental

influence. Specifically, parental smoking is a significant predictor of adolescent smoking initiation and current smoking in both developed and developing countries [5].

Children are more sensitive to different forms of marketing (such as advertising, promotion, and sponsorship, digital or otherwise), peer pressure and exposure at home, which, among other factors, can lead to early-age initiation of smoking [6]. Other studies show that about 90% of smokers begin to use tobacco at the age of 18 or younger. Most smokers become daily smokers during their adolescence [7]. In a recent study, WHO pointed out in relation to this second, often unrecognized, effect, that some children start to smoke as early as 11 years [8].

According to the second STEP wise Surveillance (STEPS) of non-communicable disease risk factors that in Mongolia 27.6% of the population smoke (48.0% of men and 6.9% of women). Nearly half the population (42.9%) was exposed to second-hand smoking at home [10]. In Mongolia, the top causes of mortality are diseases of the circulatory system and cancers [10].

Purpose of the study

The purpose of this study is to identify risk factors of current smoking and ever-smoking among adolescent students in Mongolia. It also aims to incorporate health programs and policies on how to prevent these from identifying risk factors.

To do this, below-mentioned sub-objectives are being proposed:

1. To estimate the prevalence of current smoking and ever-smoking in Mongolian adolescents,
2. To identify the risk factors of current smoking and ever-smoking in Mongolian adolescents.

This study provides useful information regarding ever smoking experience and current smoking, and associated risk factors for concerned authorities and others who need it.

Around 1.2 billion people are adolescents aged 10 to 19 and it means 1 in 6 of the world's population [11]. There are about 150 million adolescent smokers worldwide and the number continues to increase.

According to the global school health survey, the highest rate of tobacco use is among adolescents in Latin America and Caribbean countries (25.5%).

In Asia Pacific countries 15% of males and 6% of females use tobacco. The use of alcohol and drugs is also increasing among adolescents.

In 2009, the number of people aged 15-64 globally who used drugs was 149-272 million. Many premature deaths among adults result from behavior adopted during their adolescence. Many of these deaths and illnesses are preventable [12].

Health status of Mongolian adolescents:

Statistics from the Mongolia National Statistical Office show that 17.7% of Mongolia population is made up of adolescents ages 10-19. Mongolian population was around 2 million 859 thousand in 2013 and 65.1%, accounting for up to 35 youth population remains until now, of the population 51.3% were female and of 48.6% were male (Figure 1).

Figure 1. The age and gender of the population of Mongolia, by 2013

	Male		0.0% 0.0%		Female
100+			0.0% 0.0%		
95-99			0.0% 0.0%		
90-94			0.0% 0.0%		
85-89			0.0% 0.1%		
80-84			0.1% 0.3%		
75-79			0.3% 0.4%		
70-74			0.5% 0.6%		
65-69			0.7% 0.8%		
60-64			1.0% 1.1%		
55-59		1.5%		1.8%	
50-54		2.3%		2.6%	
45-49		2.9%		3.1%	
40-44		3.4%		3.5%	
35-39		3.8%		3.8%	
30-34		4.3%		4.2%	
25-29		5.2%		5.1%	
20-24		5.2%		5.1%	
15-19		4.3%		4.2%	
10-14		3.8%		3.7%	
5-9		4.4%		4.3%	
0-4	5.7%			5.6%	

10% 8% 6% 4% 2% 0% 2% 4% 6% 8% 10%

PopulationPyramid.net

Mongolia - 2013
Population: 2,859,174

Source: https://www.populationpyramid.net/
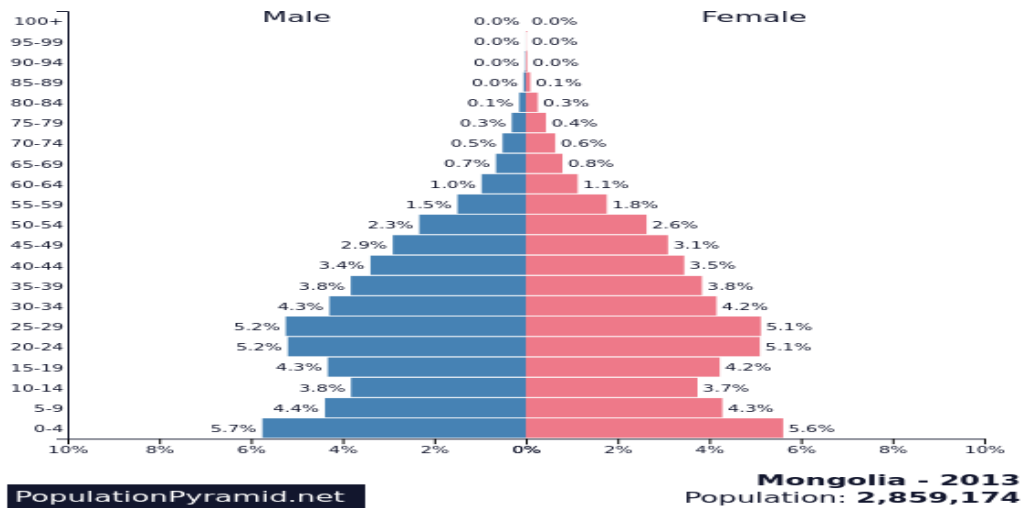
19.9 percent of Mongolian youths aged 15-24 have smoked a cigarette. According to the Global health school-based survey (2013) showed a strong association was observed between peer physically attacked, fight and bullied and current smoking among adolescents in Mongolia [12].

However, that behavior and its associated factors among adolescents in Mongolian are unknown. Moreover, a high association was assumed between drinking alcohol, used drug and parents smoking and parental understanding of their problems and current smoking students as well.

6.4 percent of adolescents experienced mental and behavioral illnesses, 13.1% of adolescents reported digestive diseases, 11.3% reported respiratory diseases and 14.5% reported injuries and other external causes of disease [13].

Tobacco use among Mongolia's school-going children is similar to that of China but lower than other Asia-Pacific countries by 1-2 times as shown in Table 1 below [12].

Table 1. Comparison of schoolchildren tobacco usage by country, 2013

Asia-Pacific countries	Smoked cigarettes one or more times in past month, % (95%CI)[*]	Smoked first time at age 14 or younger	Experienced secondhand smoke in past week, % (95%CI)
China-2003	8.7	-	61.5
Niye-2010 (Free association with New Zealand)	16.1	86.9	61.6
Nauru-2011	22.1	91.9	61.8
Philippines-2011	11.0	65.6	50.0
Kiribati-2011	26.1	76.4	77.2
Solomon Island-2011	24.0	61.9	73.9
Cook Island-2011 (Free association with New Zealand)	19.7	90.8	68.1
Mongolia-2013	9.4	61.4	60.8

Resource: http://www.cdc.gov/gshs/countries/westpafic/index.htm, 2013, Mongolia

The second nationwide survey, "Global School-Based Student Health Survey of Mongolia" (GSHS-2013) was carried out with financial and technical assistance from the Ministry of Health, MCA, WHO with the purpose of assessing the current trends and results of the interventions to prevent non-communicable diseases and determine health behavior risk factors among Mongolian adolescents students [12].

Therefore, the objective of the study was to identify the prevalence of current smoking and smoking experience, as well as associated demographic and the behavioral risk factors of ever smoking experience and current smoking.

METHODS

Design and Data source

This a retrospective, cross-sectional descriptive was performed. We used secondary data from Mongolia GSHS which was conducted by using an international standard methodology to produce a representative sample of all students who are studying in public and private secondary schools who are 12 years old and over in Mongolia. The GSHS employed a two-stage cluster sample design to produce a representative sample of students in high schools and secondary schools from 19 provinces and 8 districts of Mongolia. "This survey obtained data by using questionnaires and anthropometric measurement methods in May of 2013 in which students in each selected class were required to sign a consent form and asked to participate voluntarily in the survey. The questionnaires were developed by a team of experts which consisted of members from the WHO, UNAIDS, UNICEF, UNESCO, and US CDC, and 58 questions were from the core questionnaire modules and 26 questions were expanded from the GSHS to country-specific questions. The questionnaire contained 84 questions addressing a range of topics such as;

demographics, dietary behaviors, hygiene, violence and unintentional injury, mental health, tobacco use, alcohol use, drug use, sexual behaviors, physical activity and protective factors" [12].

Participants

"The total number of participants was 5393. All schools from urban and rural areas were selected with a probability proportional to school enrollment size to produce a representative sample of students in grades 7 or above. First stage - A total of 60 schools were selected randomly from urban and rural areas. The second stage - Grades 7-12 were selected randomly among all eligible classes. All students in the sampled classrooms were eligible to participate in this survey. All relevant classes in each selected school were included in the sampling frame. All students in the sampled classrooms were eligible to participate in the GSHS (2013) All 59 schools from 60 selected (urban-25 and rural-34) areas participated in the survey. All prevalence estimates were computed with 95% confidence intervals. The overall response rate was 88% and students' coverage was 89%" [12].

Characteristics of Participants

Mongolia has several large cities: Ulaanbaatar, Erdenet, and Darkhan have populations of about 1.2 million, 90 000 and 75 000, respectively. Such cities have a central area (city center or downtown), usually with more affluence, surrounded by sometimes considerable urban sprawl or suburbs (city outskirts). For the purposes of this survey, students living in either the city center or outskirts were considered "Urban." Mongolia has a series of administrative divisions. The country is divided into 21 provinces, generally ranging in population from 50 000-100 000 inhabitants. Each province has a center or central town. The provinces are in turn divided into 329 districts, each with about 5 000 inhabitants.

Each district is again subdivided into division(baghs), which serve mainly to sort families of nomads into groups. Students living in the province center, district, and divisions were generally considered "Rural," although some provinces centers are sufficiently urbanized to be deemed urban [12].

Measurement

The dependent variable in this survey "Current Smoking" was measured using 2 questions: (a) During the past 30 days, on how many days did you smoke cigarettes? (with current smoking defined as smoking on at least 1 day during the past 30 days), (b) Initiation of smoking was assessed with the question "Among adolescents who ever smoked cigarettes, the percentage who first tried a cigarette before age 14 years ?".

The survey independent variables were gender, age, being physical attacked, being physical fighting, being bullied, drinking alcohol, using drugs, parental understanding of their troubles, and parental tobacco consumption(Table 2). We were used bivariate and multivariate models to estimate the association between current and ever-smoking and, sex, age, physical attacked, physical fights, bullying, drinking alcohol, drug use, parental tobacco use and patents understanding their problems.

Table 2. The survey of study variables, Mongolia.

Variables	Classification	Survey Questions
In fight	One or more times / Never	During the past 12 months, how many times have you been in a physical fight?
Bullied	One or more times / Never	During the past 30 days, were you bullied?
Attacked	Yes / No	During the past 12 months, were you physically attacked?
Parental understanding	Never/rarely /sometimes / Most of the time/always	During the past 30 days, how often did your parent or guardian try to understand your problems or worries?
Ever Smoking	Yes / No	Among students who ever smoked cigarettes, the percentage who first tried a cigarette before age 14 years?
Current smoking	One or more times / No	During the past 30 days, on how many days did you smoke cigarettes?
Parents smoking	Father/mother/both / Neither	Which of your parents or guardians use any form of tobacco?
Alcohol	One or more times / No	During the past 30 days, on how many days did you have at least one drink containing alcohol?
Drug use	One or more times / No	During the past 30 days, how many times have you used marijuana (also called hashish or cannabis)?

Source: GSHS, 2013, Mongolia

9

Data Collection and Analysis

A total of 5393 school adolescents participated in the survey and an overall response rate was 88%. The data on 5393 of respondents classified as smoking and nonsmoking were analyzed using statistical analysis SPSS version 25. Descriptive statistics were used to elaborate on the demographic characteristics (age and sex) of the sample and to estimate the prevalence of susceptibility to smoking. Chi-square analysis was used to test the associations between the categorical independent variables (sex, being bullied, etc.) with susceptibility to smoking.

To determine the factors contributing to current smoking, bivariate and multivariate logistic regression analysis was conducted. The factors that were significant at the 5% level in bivariate analysis were included in multivariate analysis. Unadjusted and adjusted odds ratios (ORs) were presented with the 95% confidence intervals (CIs) and p values. The Hosmer and Lemeshow test were applied to determine the goodness of fit of the models.

RESULTS

A total of 5393 school adolescents participated in the survey and an overall response rate was 88%. A total of 5322 students completed usable questionnaires for the current smoking. Missing data was 71 (1.3%).

Of the participants, 48.3% (2480) were male and 51.7% (2842) were female respondents. Among 5322 students, 451 students (8.4%) were current smokers. Characteristics of current smoking adolescents are described in Table 3.

To identify the factors related to current adolescents smoking, we compared the current smoker and non-smoker.

Risk factors for current smoking: Among 48.3% male, 68.7% (310) was current smokers and 44.5% (2170) was non-smoker students and 51.7% (2842) female, current smokers were 31.2% (141), and non-smokers were 55.4% (2701). However, the majority, 57.9% (3084) were aged 13-15, 30% (1599) was 16 years older. The current smoker in the majority age, 16-18 were 59.2% (267), and between aged 13-15 were 38.3% (173).

Most of risk factors for the current smokers were higher than the non-smokers. Being physical fights (72.7% vs 2.5,< 0.001), Parents smoking (53.8% vs 4.2%, P< 0.001), Ever smoking (50.7% vs 4.5%, P< 0.001), Drinking alcohol (47.4% vs 4.6%, P< 0.001), Being physical attacked (47% vs 4.9%, P< 0.001), Being bullied (32.5% vs 5.8%, P< 0.001) and Parents did not understand their problem (18.6% vs 7.5%, P< 0.001) and using the drug (16.7 vs 8.5%, P< 0.001), (Table 3).

Table 3. Characteristic of respondents on current smoking adolescents.

Variables	Total N=5322	Current smoker N=451 (00%)	Non-current smoker N=4871 (00%)	P-value
Sex				
Male	2480 (48.3)	310 (68.7)	2170 (44.5)	<0.001
Female	2842 (51.7)	141 (31.2)	2701 (55.4)	
Custom age, years				
11	57 (0.1)	3 (0.6)	53 (1)	
12	591 (10.9)	12 (2.6)	579 (11.8)	
13	1094 (20.3)	28 (6.2)	1066 (21.8)	
14	980 (18.2)	46 (10.1)	934 (19.1)	<0.001
15	1010 (18.7)	99 (21.9)	911 (18.7)	
16	728 (13.5)	110 (24.3)	618 (12.6)	
17	686 (12.7)	125 (27.7)	561 (11.5)	
18	185 (0.3)	32 (7)	153 (3.1)	
Physically attacked	454 (8.5)	212 (47)	242 (4.9)	<0.001
Physical fights	452 (8.5)	328 (72.7)	124 (2.5)	<0.001
Bullied	430 (8.3)	147 (32.5)	283 (5.8)	<0.001
Ever smoking	451(41.7)	229 (50.7)	222 (4.5)	<0.001
Parents use of tobacco	449 (8.4)	243 (53.8)	206 (4.2)	<0.001
Parents understand their problems	452 (8.5)	84 (18.6)	368 (7.5)	<0.001
Drinking alcohol	439 (8.3)	214 (47.4)	225 (4.6)	<0.001
Drug using	446 (8.4)	29 (16.7*)	417 (8.5)	<0.001

Source: Authors calculation, p<0.05 is significant. N = sample.

＊Drug using variable calculated by Relative Risk(a/a+b/c/c+d) on 2x2 table.

Risk factors for ever-smoking:

A total of 5393 school adolescents participated in the survey and an overall response rate was 88%. A total of 5262 (97.5%) students completed usable questionnaires for the ever smoking. Missing data was 131 (2.4%).

Among adolescents who ever smoked cigarettes, the percentage who first tried a cigarette before age 14 years is described in Table 4.

Overall, 1224 (23.2%) students reported they have at some point smoked a cigarette before age 14 years. Among the 46.5% (2440) male, 59.7% (731) were ever smokers and 42.5% (1709) were never smoker students. Of the 53.4% (2802) female, ever smokers were 28.9% (354), and never smokers were 60.9% (2448). The ever smoker aged between 16-18 was 43.1% (528), and never smokers were 66.9% (1065). Similarly to older-aged adolescents, the ever smoker among 13-15 ages ever smokers were 42.4% (520) and never smoker was 47.7% (2501).

The higher risk factor was found in ever smokers student. Being physical fights (56.2% vs 9.8, < 0.001), Parents smoking (45.2% vs 13.2%, P< 0.001), Current smoking (36.8% vs 15.7, P< 0.001), Being physical attacked (36.1% vs 16.1%, P< 0.001), Being bullied (29% vs 16.8%, P< 0.001) and Drinking alcohol (25% vs 18.8%, P< 0.001).

However, the risk factor for ever smoking related to lack of parents understands their problem was lower than never smokers (18.5% vs 21.1%, P< 0.001) and Using drugs (2.8% vs 25.9%, P< 0.001), (Table 4).

Table 4. Among adolescents who ever smoked cigarettes, the percentage who first tried a cigarette before age 14 years

Risk factors	Total N=5262	Ever smoker N=1224 (00%)	Never smoker N=4018 (00%)	P-value
Sex				
Male	2440 (46.5)	731 (59.7)	1709 (42.5)	<0.001
Female	2802 (53.4)	354 (28.9)	2448 (60.9)	
Age in years				
11	52 (0.9)	2 (1.6)	50 (1.2)	
12	584 (11)	42 (3.4)	542 (13.4)	
13	1073 (20.3)	105 (8.5)	968 (24)	
14	961 (18.2)	171 (13.9)	790 (19.6)	<0.001
15	987 (18.7)	244 (19.9)	743 (18.4)	
16	726 (13.7)	220 (17.9)	506 (12.5)	
17	685 (13)	249 (20.3)	436 (10.8)	
18	182 (3.4)	59 (4.8)	123 (3)	
Physical attacked	1089 (20.7)	442 (36.1)	647 (16.1)	<0.001
Physical fights	1085 (20.7)	689 (56.2)	396 (9.8)	<0.001
Bullied	1033 (20.3)	355 (29)	678 (16.8)	<0.001
Parents use of tobacco	1086 (20.7)	554 (45.2)	532 (13.2)	<0.001
Current smoking	1082 (20.7)	451 (36.8)	631 (15.7)	<0.001
Drinking alcohol	1066 (20.6)	307 (25)	759 (18.8)	<0.001
Using drugs	1079 (20.6)	35 (2.8)	1044 (25.9)	<0.001
Parents understand their problems	1078 (20.6)	227 (18.5)	851 (21.1)	<0.001

Source: Authors calculation, p<0.05 is significant. N = sample.

14

Correlations among Variables

Among adolescents, currently smoked cigarettes, bivariate and multivariate analysis are described in Table 5.

Table 5. Bivariate and multivariate analysis of current smoking adolescents.

Risk factors	Bivariate analysis			Multivariate analysis		
	OR	95% CI	P value	OR	95% CI	P value
Sex (male)	1.95	1.66-2.32	0.000	2.86	2.45-3.41	0.000
Age, years	2.66	2.26-3.14	0.000	3.10	2.49-3.85	0.000
Parents use of tobacco	1.31	1.12-1.53	0.000	1.32	1.03-1.68	0.000
Physically attacked	1.61	1.36-1.92	0.000	1.57	1.19-2.07	0.000
Physical fights	2.53	2.11-3.03	0.000	2.71	2.02-3.63	0.000
Bullied	1.09	0.91-1.30	0.348	1.21	0.87-1.68	0.002
Drink alcohol	10.0	8.49-11.9	0.000	10.5	7.96-13.8	0.000
Used drugs	5.48	2.89-10.3	0.000	6.54	2.55-16.7	0.000
Parents understand their problems	1.47	1.22-1.78	0.000	6.78	5.61-8.18	0.001

Source: Authors calculation, p<0.05 is significant, 95%CI-confidence interval, OR-odds ratio.

15

Risk factors for current adolescent smoking:

In a bivariate model, the adolescents in the 'current smoker' had high increased odds of drinking alcohol (OR 10, 95% CI 8.49-11.9), using drugs (OR 5.48, 95% CI 2.89-10.3) and increased odds of age, years (OR 2.66, 95% CI 2.26-3.14), being physical fights (OR 2.53, 95% CI 2.11-3.03), gender (male) (OR 1.95, 95% CI 1.66-2.32), being physically attacked (OR 1.61, 95% CI 1.36-1.92), lack of parents understanding their problems (OR 1.47, 95% CI 1.22- 1.78).

parents use of tobacco (OR 1.31, 95% CI 1.12-1.53) and being bullied (OR 1.09, 95% CI 0.91to 1.30) as well.

In the further study, the multivariable analysis showed that current adolescents smoking were highly likely to be associated with drinking alcohol (OR 10.5, 95% CI 7.96-13.8), lack of parents understand their problem (OR 6.78, 95% CI 6.61-8.18), using drugs (OR 6.54, 95% CI 2.55-16.7), and high associated with age(years) (OR 3.10, 95% CI 2.49-3.85), gender (male) (OR 2.86, 95% CI 2.45-3.85), being physical fights (OR 2.71, 95% CI 2.03-3.63), being physically attacked (OR 1.57, 95% CI 1.19-2.07), parents use of tobacco (OR 1.32, 95% CI 1.03-1.60), and being bullied (OR 1.21, 95% CI 0.87-1.68), (Table 5).

DISCUSSION

Characteristic and Structural

According to the results of the research, the majority of current smokers are 16-18 year-olds male.

It is similar to the researcher conducted that Harris Hyun-soo Kim which was 31 low-income countries (GSHS) datasets collected between 2003 and 2011, were pooled to create a single data file consisting of 58 956 students (28 299 male and 30 657 female) in and it showed that "older and male adolescents are more likely to smoke", but age differences have been observed.

In the research Harris Hyun-Soo Kim, older male adolescents had high levels of smoking, which is similar to our research, but according to the study of the Global School Health survey (GSHS) of Singapore, 13-15 year-old male adolescents smoking rate is being so high [15].

Generally, male adolescent showed higher rate of current smoking compared to that of female. It could result from the high rate of adult male smoking and cultural aspect. In most Asian countries males can smoke freely but it is impossible thing for women. Regarding it, male adolescents current smoking has been relevant with this perception.

The results of the next finding that the current smoker's proportion of smokers before 14 years old was 50.7% or highly correlated. The World Health Organization and international adolescent's smoking researches has mentioned about it. Recently approved research of the World Health Organization has highlighted that some children are smoking before 11 years old regarding unacceptable influence or parent's smoking. And these studies have shown that children who smoke early in life will likely be more likely to become smokers. In addition, the study of Kuang Hock Lim found that adolescents who have smoker's parents were more vulnerable to smoking [16].

By another study, most of participants has answered as most of the adolescents aged 12-15 started smoking before 11 years old, and half of the participants in the smoking survey reported as half of the smokers are started using tobacco before 11 years old [17]. Therefore, our findings suggest that serious and effective measures needed to be taken. Also, adjusted health information and health education related to the use of tobacco, including tobacco and other addicts, should begin as early as possible.

In a multivariate and bivariate analysis of this survey using alcohol, using drugs, age, gender(male), had been a physical fight, had been physically attacked and parental smoking were the high-risk factors for the current smoking of adolescents in Mongolia. Also by a research of Harris Hyun-Soo Kim, most of smokers had been faced with bulling or physical fights [15]. By a research of Sameera and Senanayake, adolescents had incurred with physical fight (OR 4.0, 95% CI 2.4-6.6), physical attacked (OR 2.5, 95% CI 1.5- 4.0) and bulling in last 12 months. Currently smoking was connected with (OR 2.3, 95% CI 1.5-3.6) parents smoking (OR 2.2, 95% CI 1.4-3.4) and alcohol usage in their study [18]. By research of Myers MG and Brown SA adolescents smoking is closely related with usage of alcohols and drug abuse. The usage of tobacco and alcohols has developed by common etiological factors and it spread rapidly for adolescents who addicted for smoking and alcohol using [14]. According to one study among addicted adolescents for using narcotic drugs, 75% of respondents smoke every day and 61% uses half of one package tobacco in a day [14]. Brown and his colleagues have announced that early usage of the tobacco has positive connection with usage of drugs during their lifetime [19].

Adolescents are the most vulnerable age to try and attend everything. Because of these high risk factors, smokers are more likely to be exposed, so we need to be prepared for preventive action. Adolescent is our future.

Limitations

There are several limitations in this study. First, causal relationships between dependent and independent variables cannot be identified in this study because of its cross-sectional design.

Furthermore, self-reported reporting on smoking was likely to may be subjected to respondents' reluctance to disclose their intention to smoke in the future.

Besides, risk factors shown to be associated with susceptibility to smoking such as receptivity to tobacco advertisement (direct or indirect), social appearance, socioeconomic status, exposure and access to health information, peer smoking, perceived prevalence of peer smoking, and academic achievements, all were previously shown to be associated with susceptibility to smoking were not investigated in the current study.

Therefore, in the long-term study, it is advisable to examine the various factors and their sensitivity to the causes of smoking.

Significance

However, confidentiality and absence of school personnel during the survey provided an opportunity for respondents to provide information without fear and stress, and increased the willingness to disclose adequate and true information about factors associated to smoking.

Private and Public School Students of Mongolia has large sample modeling and high response rate adds to the strength of this research work.

In this case, the results of this research may still provide useful cues for the development of effective strategies within future programs designed to stem out the smoking scourge among Mongolian adolescents.

CONCLUSION AND SUGGESTIONS

Conclusion

The study was conducted to examine the prevalence and risk factors associated with current and ever smoking among school-going adolescents in Mongolia. Although the prevalence of current smoking in this adolescent population in Mongolia may not be as high as in some high-income countries, this study found a high prevalence of current smokers who were from 16 to 18 ages especially males.

This study identified a number of risk factors for current smoking. Male, having been physically fight, parental smoking, ever smoking, drinking alcohol, using drugs and having been physically attacked, having been bullied and parental under-support for their problems were the risk factors current smoking.

Therefore we have to develop school health program and organize social community team which including their parents particular focus on young adolescents, as smoking is often initiated early.

School-based health programs should be developed which take the risk factors associated with current smoking and ever smoking among school-going adolescents in Mongolia into consideration.

Suggestions

Governance: Adolescent health is needed to strong leadership, within the Ministry of Health and between different ministries especially Ministry of Education in Mongolia to collaborate and to ensure an adolescents health focus in key policies, including those related to high risk protection; training and education of providers; quality improvement; health management and information systems; and infrastructure. It is necessary to implement legal and regulatory frameworks that adopt a human rights approach and guarantee access to services in the most and best interests of adolescents, including those most marginalized and vulnerable.

Ministry of Education: Adolescents' expectations and perspectives are included in national programming processes. Adolescent leadership and participation should be institutionalized and actively supported during the design, implementation, monitoring, and evaluation of adolescent programs including the high risk behavior change.

Ministry of Health: Strengthening service-delivery platforms that maximize coverage, for example, e-health and school health services (school-based and school-linked) to facilitate adolescents' access to preventive services is necessary.

Furthermore, health workers' core competencies (i.e. knowledge, skills, and attitudes) who are in places that adolescents visit (e.g. hospitals, primary care facilities, and pharmacies) are needed. The healthcare workers can cope with adolescent specific needs (for example, take advice on how to avoid bullying and fighting and smoking) Moreover, regularly prevention activities for school children will be planned and a smoking cessation program for smokers can be implemented

Parents and guardians: Organizing activity of social community work with parental/guardians is needed and work together for smoke free air

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