

Prevalence and Predictors of Cigarette Smoking among Adolescents of Ethiopia: School Based Cross Sectional Survey

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Abstract

Background: Tobacco use is one of the leading public health threats in the world causing different health, and psychosocial risks. At a moment the spread of tobacco use is growing at fast in the adolescents, who are the future of the country. However, little information is known about the magnitude and predictors of tobacco use in Ethiopia.

Objective: This study was aiming to assess the prevalence and associated factors of cigarette smoking among adolescents of Ethiopia

Methods: school based cross sectional study was conducted from April 10 to April 15, 2014 in 12 high schools selected randomly from public and private sectors, three from each in Hawassa town, and Jimma town, Ethiopia. Students [n = 1673] from grade 9-12, in the age limit of 13-19 were included in the study. Data were collected by self-administered questionnaire that is adapted from global youth tobacco survey questionnaire. Bivariate and multivariate analysis were made using logistic regression on SPSS version 20.0 software in order to predict factors associated with tobacco use.

Result: The prevalence of cigarette smoking among adolescents were found to be 28.6% ever smokers, and 17.2% current smokers. In addition, more than half [60.8%] of adolescents were exposed to tobacco smoke from others in public places. In the multivariate analysis sex, alcohol use, parent smoking, peer smoking, exposure to movie with actors smoking, not being exposed to anti-smoking media messages, not discussing in the class about danger of smoking, and having perception that smoking is not dangerous to health were seen significantly associated with current cigarette smoking among adolescents.

Conclusion and Recommendations: The prevalence rate is increasing in its spread, the gap between male and female is decreasing and exposure to environmental tobacco exposure is widespread. Therefore the government of Ethiopia should legislate, enact, and enforce laws that decrease accessibility of cigarette, totally ban smoking in the public places, and prohibit tobacco advertisement and promotions in Medias and movies. Moreover adolescents of the country should be enriched with the knowledge on the dangers of tobacco use.

Keywords: Tobacco use; Cigarette smoking; Adolescents; Prevalence; Global youth tobacco survey

Introduction

Tobacco use, in any form, is deadly. Smoking kills one-third to one-half of all lifetime users, and smokers die an average of 15 years earlier than non-smokers do. If current trends continue, tobacco will kill 7 million people annually by 2020 and more than 8 million people annually by 2030. Tobacco-attributable mortality is increasing rapidly in developing countries, and by 2030, about 83 percent of the world's tobacco deaths will occur in low- and middle-income countries. Tobacco also causes hundreds of thousands of deaths annually among nonsmokers [1].

A disproportionate share of the global tobacco burden falls on developing countries, where 84% of the 1.3 billion people current smokers reside. The World Health Organization (WHO) attributed approximately 5 million deaths a year. Recent trend indicate rising of smoking prevalence among children and adolescents and earlier age of initiation start below seven years of age to 18 years. If this trend continues tobacco use will result in the death of 250 million children and adolescents alive today and many from developing countries [2-7].

Tobacco kills more men than women worldwide because historical smoking prevalence has been higher among men than women. However, because smoking rates are increasing among women in many countries, particularly among young women, the gap in tobacco death rates between men and women is closing. This might be due to increase in smoking

among young girls compared to adult female, the high susceptibility of smoking among never smokers, high levels of exposure to second hand smoking and pro-tobacco indirect advertising. The increase in number of death is due to new methods adapted by the tobacco products companies that encourages and deceives the community in particular the youth generation in using the products [8].

Almost 1 billion men in the world smoke about 35 percent of men in high-resource countries, and 50 percent of men in developing countries. Male smoking rates have now peaked, and trends in low- and middle-resource countries indicate slow but sure declines. However, this extremely slow trend is progressing over decades while, in the meantime, tobacco is killing about 5 million men every year [8,9].

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With 88 million people in 2012, Ethiopia is the second most populous nation after Nigeria in sub-Saharan Africa with Children under the age of 15 years comprises about 45% of the total population. Tobacco use prevalence, according to third edition of Tobacco Atlas is 6.9% male and 0.5% female. The number of smokers in Ethiopia is higher than most African countries of its population size but the production of tobacco is increasing at a higher rate. Currently the demand for tobacco is about 4.4 billion pieces but the production capacity is about 2.6 billion cigarettes or 53% the remaining 4.6% are imported while 42% enters the country through contraband [10]. Several studies indicate that tobacco use among Ethiopian adolescents is considerably rising. Nowadays, tobacco use is widely consumed among high school and college students in Ethiopia [11-13].

The onset of tobacco use occurs primarily in early adolescence, a developmental stage that is far removed by several decades from the death and disability that are associated with smoking in adulthood. Therefore, the fact that many adult smokers initiated their smoking habit as adolescents makes adolescence smoking a significant public health problem. It is also important, as it is associated with respiratory health effects such as the incidence and exacerbation of asthma [14,15].

Most of the risk of dying prematurely due to smoking is reversed if people quit smoking before the age of 30. However smoking during childhood and adolescence also causes a range of immediate health problems, as well as laying the foundation for the development of serious disease in adulthood [16].

The World Health Assembly adopted the WHO Framework Convention on Tobacco Control on 21 May 2003 and it entered into force on 27 February 2005, it has been ratified in many of the African countries only Eritrea, Malawi, Mozambique, and Zimbabwe are yet to ratify the Convention. Even if Ethiopia ratified the convention in the late January 2014, there is a need to commitment, strength, and urge by all health development partners to intensify their support for the speedy implementation of the WHO FCTC and the placement of legislations to ensure that the public is protected from exposure to tobacco. Therefore this study can help magnificently for the different stakeholders, the community, and the government by revealing the magnitude and the determinants of tobacco use in the adolescents who are the future of the country.

Methods and Materials

Study setting and participants

The school based cross sectional study was conducted from April 10 to April 15, 2014 in school adolescents aged 13-19 years who are enrolled in grade 9-12 in the public and private schools of Hawassa and Jimma town in Ethiopia.

Sample size and sampling procedures procedure

Sample size was calculated by using single population proportion formula with the assumption of 50% proportion of tobacco use among adolescents, 5% margin of error, and 95% confidence interval. Hence the sample size calculated was 1704 samples.

Multi stage sampling of students on grade 9-12 who were enrolled in the private and public schools of Hawassa and Jimma town were included in the sampling frame. At the first stage, three high schools from each towns and each sector [total of 12 schools] in Hawassa and Jimma town were selected randomly. Then at the second stage students from grade 9-12 were selected based on proportion to student size and included to the final study subjects by using simple random sampling

from the registrar list of all students in their specific class until the desired sample size.

Data collection procedures

Global Youth Tobacco Survey [GYTS] questionnaire that were adapted to the Ethiopian context were used to conduct the survey. This questionnaire is self-administered type of questionnaire, which consisted of a core component and an optional component. The core questions have been used in all countries conducting the Global Youth Tobacco Survey [GYTS], which allow for international comparison of results, and some optional questions were used to address specific issues in Ethiopia. The GYTS core questionnaire aims to collect the following information: prevalence of cigarette smoking and other tobacco use among young people; knowledge and attitudes of young people towards cigarette smoking; role of the media and advertising on young people's use of cigarettes; access to cigarettes; tobacco-related school curriculum; exposure to environmental tobacco smoke [ETS] and cessation of cigarette smoking. All the questions were multiple choices and were translated to the official language, Amharic.

Both the data collectors and supervisors were trained for three days on the objective and methodology of the research, and data collection approach. Moreover, survey procedures were designed to protect the student's privacy by allowing for anonymous and voluntary participation.

Definition and measurement of outcome variable

Current status of smoking was assessed using question: during the past 30 days [one month], on how many days did you smoke cigarettes?

Data processing and analysis

Data were analyzed using SPSS version 20.0 software and Proportions and 95% confidence intervals were obtained as estimates of prevalence. Associations between independent variables and dependent variables were analyzed first using bivariate analysis to identify factors which are significantly associated with tobacco use. Then Multiple logistic regression was applied using enter method with $p < 0.05$ and $p > 0.25$ criteria to enter and exit from the model respectively. The magnitude of the association between the different independent variables in relation to dependent were measured using odds ratios and 95% Confidence Interval (CI) and P values below 0.05 were considered statistically significance. Hosmer-Lemshow goodness-of-fit was applied to find the appropriateness of model.

Ethical consideration

Ethical clearance was obtained from of the program coordinating parties (IRBs and Councils of science and technology) and Jimma University Ethical review board. Permission from the officials governing the town educational department and the respective schools were obtained, and then informed consent was obtained from the study participants after explaining the purpose of the study. Participants were assured that their name will not be stated, data will be kept confidential and anonymous and it will be used only for research purpose. Confidentiality of the information given by the respondent was maintained and the privacy of the students were kept during data collection.

Result

A total of 1673 respondent's data were analyzed, with the response rate of 98.2%. Among them 47.7% were males and 52.3% were females and majority of them were in the age category of 16-17 years (60.2%).

Prevalence of Cigarette smoking

Among the surveyed school adolescents 28.6% (95% CI 26.5 – 30.9) were ever smoked cigarette at least one puff, 21.2% males and 7.4% females. An estimated 17.2% (95% CI 15.4 – 19.1) of the adolescents were current smokers, 13.3% males and 3.8% females (Table 1).

Majority of the respondents (18.1%) first initiated smoking at the age interval of 14 – 15 years. Among the respondents 253 (15.1%) of them usually smoked 2-5 cigarettes on the days they smoked, and majority (14.8%) of them buy their cigarette often from shop. Moreover 16.1% of the respondents who are smoking currently spend more than 20 birr for cigarette in the last month preceding the survey, while majority (44.6%) of them had pocket money of 51 – 100 birr in the month (Table 2).

Knowledge and attitude perceived about smoking

Overall, 329 (19.6%) of adolescents think that boys who smoke cigarettes have more friends and around 13% of adolescents think that girls who smoke cigarettes have more friends. Likewise, 526 (31.4%) of adolescents think that boys who smoke are more attractive and 30% of them think that girls who smoke are more attractive. Only 18.6% of the surveyed school adolescents indicated that they discussed the harmful effects of smoking with a family member. Majority of the adolescents (82.8%) indicated that once someone starts smoking it is difficult to quit. Almost all of the surveyed adolescents (94.6%) showed they definitely think that cigarette smoking is harmful to health. However most of the adolescents think that smoking helps to lose weight (74.9%) (Table 3). Parents of the adolescents were smokers in 85.1 % of

Variables	Male (n = 793)	Female (n = 880)	Total (n = 1673)
Ever tried cigarette smoking			
Yes	355 (21.2%)	124 (7.4%)	479 (28.6%)
No	438 (26.2%)	756 (45.2%)	1194 (71.4%)
Currently smoking			
Yes	223 (13.3%)	65 (3.9%)	288 (17.2%)
No	570 (34.1%)	815 (48.7%)	1385 (82.8%)

Table 1: The prevalence of tobacco use among school adolescents in Ethiopia, June 2014.

Variables	Frequency (percent)
Number of cigarettes usually smoked	
2 – 5 cigarettes	257(15.4%)
6 – 10 cigarettes	31 (1.8%)
Got cigarette most often from	
I bought from shop	249 (14.9%)
I borrowed from somebody else	39 (2.3%)
Shopkeeper refuse to give cigarette	
Never go shop for cigar	1342 (80.2%)
No	331 (19.8%)
Place where most often to smoke	
At school inside the premises	159(9.5%)
At school outside the premises	80(4.8%)
At social events	49 (2.9%)
Brand of cigarette smoked	
Niyalla	263 (15.7%)
Rothman	25 (1.5%)
Expense for cigarette in last month	
≤50 birr	20 (1.2%)
>50 birr	268 (16.0%)
Pocket money in the last month	
≤100 birr	1044 (62.4%)
>100 birr	629 (37.6%)
Drink Alcohol	
Yes	521 (31.1%)
No	1152 (68.9%)

Table 2: Smoking behavior among school adolescents in Ethiopia, June 2014 (n = 1673).

Variables	Frequency (percent)
Parent smoking	
None of them smoke	1249 (74.7%)
Both smoker	89(5.3%)
Only father smoker	335 (20.0%)
Closest friend smoker	
No one smoke	1239 (74.1%)
Some of them smoke	204 (12.2%)
Many of them smoke	230 (13.7%)
Discussed the harmful effect of smoking in the family	
Yes	312(18.6%)
No	1361 (81.4%)
Think it would be difficult to quit once someone has started smoking	
Definitely yes	1386 (82.8%)
Probably yes	88 (5.3%)
Definitely no	199(11.9%)
Think boys who smoke cigarettes have	
More friends	329 (19.6%)
Less friends	197 (11.7%)
No difference from non smokers	1147 (68.7%)
Think girls who smoke cigarettes have	
More friends	215 (12.9%)
Less friends	285 (17.0%)
No difference from non smokers	1173 (70.1%)
Think smoking helps boys look more attractive	
Yes	526 (31.4%)
No	1147(68.6%)
Think smoking helps girls look more attractive	
Yes	500 (29.9%)
No	1173 (70.1%)
Smoking is harmful to health	
Yes	1583 (94.6%)
No	90 (5.4%)
Think that smoking cigarettes makes to	
Gain weight	352 (19.8%)
Lose weight	1253 (74.9%)
No difference	88 (5.3%)

Table 3: Knowledge and attitude perceived on tobacco use among adolescents of Ethiopia, June 2014 (n = 1673).

current smokers and 52.8% of ever smokers. Similarly almost all of the adolescents smoking currently have smoker closest friends and so do 62% of ever smokers (Figure 1and 2)

Environmental exposure to tobacco smoke

About 17% of adolescents are likely to be exposed to tobacco smoke from others in their home in the past 7 days preceding the survey and more than half (60.8%) of adolescents are likely to be exposed to tobacco smoke from others in public places in the past 7 days preceding the survey.

Majority of the adolescents (84.6%) think that smoke from others is harmful to them. Moreover almost all the adolescents (95.7%) indicated that smoking should be banned from public places; among them 47.3% were males and the remaining 52.7% were females (Table 4).

Attitude towards stopping smoking

Among those currently smoking, 62.2% of the adolescents want to stop smoking cigarette at the time of survey. However, only 20.8% of them tried to stop smoking cigarette during the past year. Moreover among half of the currently smoking adolescents indicated that they would be able to stop smoking if they wanted to do and only half of them received help or advice that encourage them to quit smoking.

From ever smokers around 40% of the adolescents had quit smoking cigarette in the last year, and they have mentioned reasons for quitting

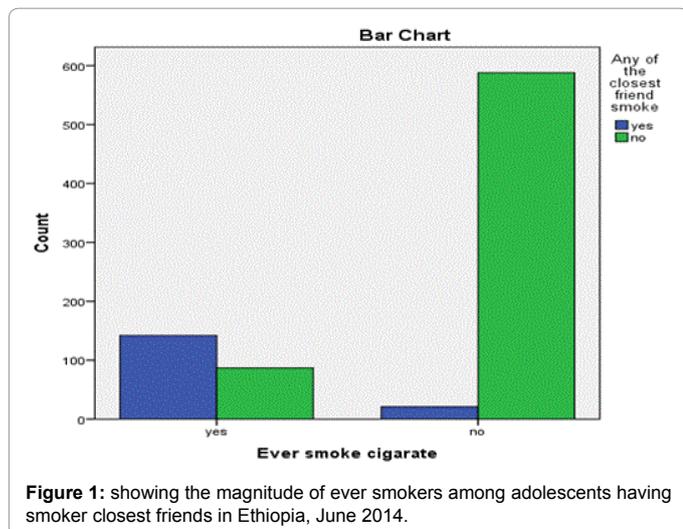


Figure 1: showing the magnitude of ever smokers among adolescents having smoker closest friends in Ethiopia, June 2014.

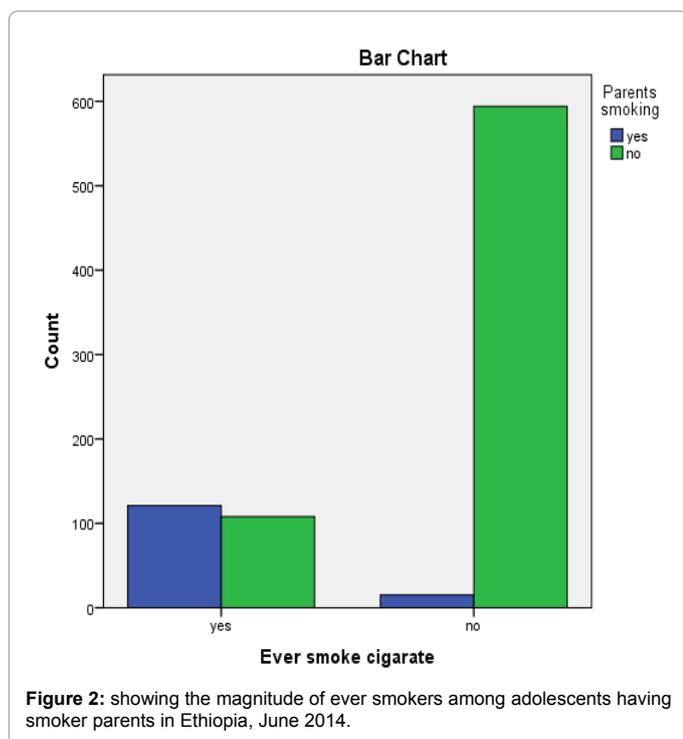


Figure 2: showing the magnitude of ever smokers among adolescents having smoker parents in Ethiopia, June 2014.

Variables	Frequency (percent)
Smoke from other people's cigarettes is harmful	
Yes	1415 (84.6%)
No	258 (15.4%)
Exposed to smoke from others in their home	
Yes	287 (17.2%)
No	1386 (82.8%)
Exposed to smoke from others in public places	
Yes	1018(60.8%)
No	655 (39.2%)
Smoking should be banned from public places	
Yes	1601 (95.7%)
No	72 (4.3%)

Table 4: Environmental exposure to tobacco smoke and their intention towards banning smoking in public places among school adolescents of Ethiopia, June 2014 (n = 1673).

smoking as to improve health (26.7%), to save money (31.9%)because family dislike it (34.1%)and friends dislike it (7.3%), (Table 5).

Exposure to Media and Advertisements

Only 37.2% of adolescents saw anti-smoking media messages in the past 30 days on television, radio, Billboards, posters, newspapers, magazines, or movies. Similarly only 28.8% of adolescents were exposed to anti- smoking messages in sports events, fairs, concerts, community

Variables	Frequency (percent)
Want to stop smoking now	
Yes	179 (62.2%)
No	109 (37.8%)
Total	288 (100%)
Ever tried to stop smoking cigarettes	
Yes	60 (20.8%)
No	228 (79.2%)
Total	288 (100%)
Quit smoking	
Yes	191 (39.9%)
No	288 (60.1%)
Total	479 (100%)
Main reason to stop smoking	
To improve health	51 (26.7%)
To save money	61 (31.9%)
Family dislike it	65 (34.1%)
Friends dislike it	14 (7.3%)
Total	191(100%)
Think you would be able to stop smoking if you wanted	
Yes	157 (54.5%)
No	131 (45.5%)
Total	288 (100%)
Ever received help or advice to stop smoking	
Yes	261 (54.5%)
No	218 (45.5%)
Total	479 (100%)

Table 5: Attitude towards stopping smoking among ever and current smoker adolescents of Ethiopia, June 2014.

Variables	Frequency (percent)
Saw any anti-smoking media messages	
Yes	622 (37.2%)
No	1051 (62.8%)
Saw anti-smoking messages in sport events, concerts	
Yes	465 (27.8%)
No	1208 (72.2%)
Saw actors smoking in movie or TV show	
Yes	1268 (75.8%)
No	405 (24.2%)
Saw advertisements for cigarettes on billboards or news paper	
Yes	550 (32.9%)
No	1123 (67.1%)

Table 6: Exposure to media and advertisements among school adolescents of Ethiopia, June 2014 (n = 1673).

Variables	Frequency (percent)
Taught about dangers of smoking	
Yes	233 (13.9%)
No	1440 (86.1%)
Discussed reasons why people their age smoke	
Yes	411 (24.6%)
No	1262 (75.4%)
Taught effects of smoking	
Yes	307(18.4%)
No	1366 (81.6%)

Table 7: school curriculum on tobacco use among school adolescents of Ethiopia, June 2014 (n = 1673).

events, or social gatherings (Table 6).

Concerning the exposure to tobacco advertisement, more than three-fourth (75.8%) of the adolescents saw actors smoking in movies or television drama shows (Figure 3 and 4). Moreover majority of them also saw people smoking in sport events and gathering of people. Even though, only 33% of the adolescents were exposed to tobacco messages in billboard and posters.

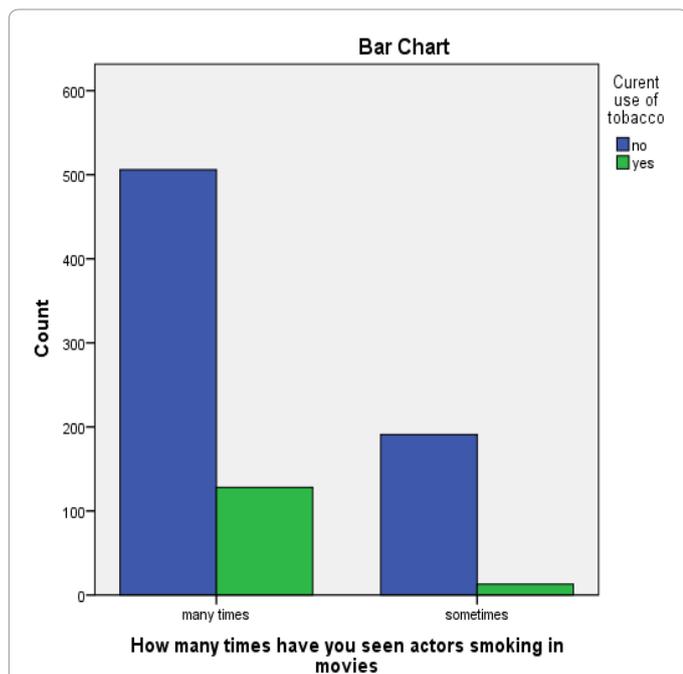


Figure 3: showing the magnitude of current smokers among adolescents who were exposed to movie at which actors are smoking in Ethiopia, June 2014.

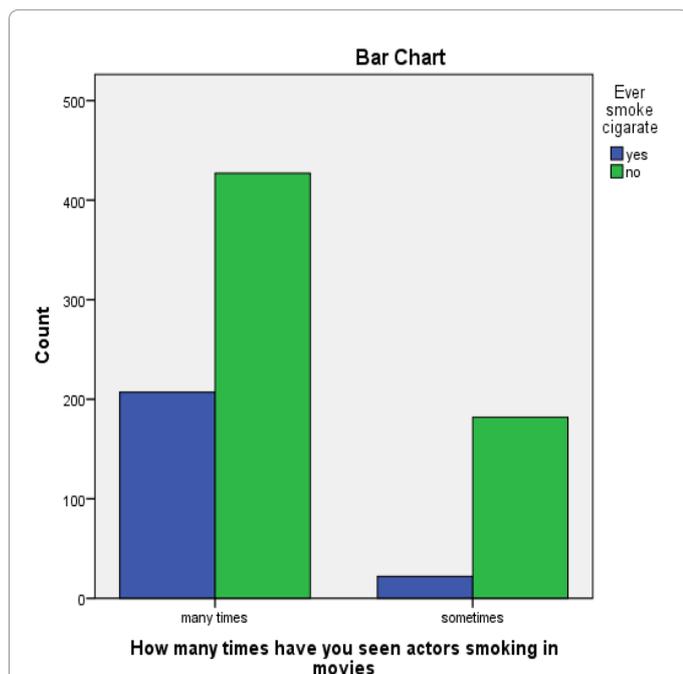


Figure 4: showing the magnitude of ever smokers among adolescents who were exposed to movie at which actors are smoking in Ethiopia, June 2014.

School curriculum about smoking

Only 14% of adolescents had been taught about the dangers of smoking in class during the past year and 24.6% of adolescents had discussed in class the reasons why people of their age smoke during the past year. Similarly, only 18.4% of adolescents had been taught in class about the effects of smoking during the past year (Table 7).

Factors associated with tobacco use

Those variables with P-value < 0.25 in bivariate analysis were entered into multivariate analysis using multiple logistic regressions in order to predict factors associated with current use of tobacco.

Accordingly sex, parent smoking, peer smoking, perceiving the danger of smoking, exposure to movie with actors smoking, exposure to anti-smoking media messages, discussion in the class about danger of smoking and alcohol use were seen significantly associated with current tobacco use among adolescents.

Male adolescents were 2.6 times more likely to use tobacco than the female adolescents (AOR = 2.669, 95% CI 1.280-6.693) and those who drink alcohol were also seen more likely to use tobacco (AOR = 11.08, 95% CI 3.515-28.266). Likewise, adolescents having either of their parents smoking were 13 times more likely to use tobacco than the counterpart adolescents (AOR = 13.24, 95% CI 2.737-26.03) and similarly adolescents having their closest friends smoking were more likely to use tobacco than those adolescents whose close friends were not smokers (AOR = 8.06, 95% CI 4.51- 14.561).

Concerning to the exposure to the tobacco related messages; adolescents who were exposed to movies whose actors are smokers were seen 2.8 times more likely to use tobacco than those adolescents who were not exposed (AOR = 2.84, 95% CI 1.703 - 11.116). However exposure to anti-smoking media messages was seen protective to tobacco use among adolescents. Thus, those adolescents who were not exposed to anti-smoking media messages on television, radio, newspaper or magazines were seen more likely to use tobacco than those who were exposed (AOR = 4.43, 95% CI 1.838 - 7.13).

Adolescents who perceived that smoking is dangerous for health were less likely to use tobacco than those who didn't perceive (AOR = 0.147, 95% CI 0.105-0.249). Moreover, those adolescents who were not taught about the danger of smoking in the class room were more likely to use tobacco than those adolescents who were taught (AOR = 3.75, 95% CI 1.122 - 16.80). Nevertheless, other variables like Age, income, and perception of being more attractive, perception of having many friends, tobacco advertisement in billboard, and shopkeeper refusing to sell cigarette were not shown statistically significant association (Table 8).

Discussion

Tobacco use is one of the most serious public health problems globally. This study aiming at assessing the prevalence and factors associated with tobacco use among adolescents of Ethiopia has described the magnitude and predictors of tobacco use and discussed as follows.

Researches on current smoking prevalence and behaviors among adolescents have reported disturbing trends for the future. The Global Youth Tobacco Survey, assessing data from more than 130 countries and principalities, has found that: the gap in smoking rates between school-aged girls and boys is decreasing, use of tobacco products other than cigarettes is widespread, a sizeable proportion of children who

Variables	Current use of tobacco		Crude OR (95% CI)	Adjusted OR (95% CI)
	Yes	No		
Sex				
Male	223	570	1.00	1.00
Female	65	815	4.905 (3.172 – 7.376)	2.669 (1.280 – 6.693)*
Age				
<18	216	1160	1.00	1.00
≥18	72	225	0.582 (0.43 – 0.787)	0.669 (0.594 – 1.005)
Ever use alcohol				
Yes	219	302	10.85 (5.155 – 25.153)	11.08 (3.515 – 28.26)*
No	69	1033	1.00	1.00
Income per month				
≤100 Birr	166	878	1.00	1.00
>100 Birr	122	507	0.786 (0.607 – 1.017)	0.773 (0.578 – 1.034)
Parent smoking				
Yes	189	232	9.07 (6.425 – 18.27)	13.24 (7.737 – 16.03)*
No	99	1103	1.00	1.00
Closest friend smoker				
Yes	180	244	7.79 (3.55 – 23.35)	8.06 (4.51– 14.561)*
No	108	1141	1.00	1.00
Think smoking is dangerous to health				
Yes	240	1343	1.00	1.00
No	48	42	0.156 (0.101-0.242)	0.147 (0.105-0.249)*
Think smoking helps boys look more attractive				
Yes	209	307	9.22 (2.59 – 11.86)	9.986 (0.313 – 14.591)
No	79	1072	1.00	1.00
Think smoking helps girls look more attractive				
Yes	201	299	8.39 (2.414 – 10.289)	8.566 (0.212 – 13.153)
No	87	1086	1.00	1.00
Saw any anti-smoking media messages				
Yes	195	427	1.00	1.00
No	93	958	4.7 (2.462 – 8.57)	4.43 (1.838 – 7.13)*
Saw actors smoking in movie or TV show				
Yes	259	1009	3.32 (2.051 – 6.734)	2.84 (1.703 – 11.116)*
No	29	376	1.00	1.00
Saw advertisements on billboards				
Yes	216	334	9.44 (4.270 – 12.781)	7.096 (0.007 – 8.302)
No	72	1051	1.00	1.00
Taught about dangers of smoking				
Yes	107	126	1.00	1.00
No	181	1259	5.907 (4.371 – 7.982)	3.75 (2.122 – 5.80)*

*Significantly associated

Table 8: Factors associated with current tobacco use among adolescents of Ethiopia, June 2014.

currently do not smoke are contemplating adopting the behavior, and children are widely exposed to secondhand smoke [17-22]. Similarly, this study has indicated increased prevalence of tobacco use among adolescents, decreased gap between the genders and high magnitude of exposure to second hand smoke in Ethiopia.

The prevalence of ever smoker among adolescents was found to be 28.6% (21.2% males and 7.4% females), and current smokers were 17.2% (13.3% males and 3.8% females). This finding of the present study is relatively lower than the prevalence from many countries globally [1,23-25]. However it is higher than studies conducted in Addis Ababa, Butajira and eastern part of Ethiopia [26-30]. This discrepancy in the prevalence might be attributed to the time of study, as many of the studies conducted in the country are not recent.

In the current study it is indicated that male adolescents are more likely to use tobacco than female adolescents are, which is consistent with many reviewed studies conducted in Addis Ababa, Eastern Ethiopia, Butajira and China [1,28-30]. This might be explained by the cultural and traditional background of the country, at which males are more mobile and responsible for outdoor activities and females are usually responsible for the activities inside their home.

This study also revealed that exposure of adolescents to second

hand smoke is unacceptably very high, where over 6 in 10 are exposed to smoke in public places even though almost all the students are favoring law prohibiting smoking in public places and agreed in banning. This finding of the current study is much higher from the study finding conducted in Kampala, Uganda [26,27]. However some efforts are being made to protect nonsmokers from environmental smoke by some service providers in Ethiopia, there is a need to intensify and implement the law banning smoking in public places in order to protect nonsmokers from second hand smoke, as it causes danger to the health of individuals.

On the other hand since there is no law prohibiting sales of tobacco products to minors [to children less than 18 years of age] in the country, the level of underage sales of tobacco products is significantly higher, almost all of current smokers showed that they purchased cigarettes in a shop that weren't refused because of their age. This data has a clear message that an easy access to tobacco products could lead to an increase in tobacco use among the youths; which in turn can increase the current smoking rate.

Many reviewed studies have shown that adolescents whose parents are smokers are more likely to use tobacco than those adolescents whose parents are not smokers [24,25]. Similar finding is seen in the present study too. This result can show us there is a need to include parents in

youth tobacco control programs. Moreover adolescents whose closest friends are smokers are more likely to use tobacco than the counterpart adolescents are. This finding is also in line with study conducted in Southern Taiwan, and Eastern Ethiopia [24,29].

A number of studies have implicated tobacco industry advertisement as possible causal agents in the stimulation of demand for cigarettes among adolescents [31-35]. However the present study revealed that tobacco industry advertisement on Billboard are not associated with tobacco use among adolescents. This inconsistency might be due to there is a ban of advertisement of tobacco products and sponsorships by tobacco industries on media, billboard, and any sport or other events [2]. On the other hand anti-smoking media messages are seen protective of tobacco use among adolescents. This show us smoking prevalence can be decreased and its spread can be halt through strengthening media anti-smoking messages.

Several review articles have shown that smoking in movies is associated with increases in adolescent smoking initiation [36,37]. Positive images through pro- advertisements in movies, dramas, spots, and access to other television channels, a significant number of youths are made to believe that smoking is 'cool', fun, glamorous, and modern, and watching their role models smoke further encourages them to smoke [2]. Similarly another study in US revealed that those adolescents who had watched more movies with smoking depiction are more likely to be smokers [38-47]. This study also revealed that adolescents who are exposed to movies whose actors are smoking were more likely to use tobacco than the counterpart adolescents. This finding indicates that the national electronic or press media should involve not only in ban of advertising but also in different media, movie, and show production industries in order to assure total ban of advertisement and promotion of tobacco.

More than three-fourth of the adolescents didn't discussed the dangers and effects of smoking in class during the past year, these shows the health hazards of smoking are not being adequately given within the school environment. Adolescents who were not taught about the danger of smoking in the class are more likely to use tobacco than those who were taught. In addition, those adolescents who perceived the danger of tobacco use are less likely to use tobacco. This result shows that there is a need to revise school curriculums, refresh the school community about the dangers of tobacco, and need for strong engagement for increasing the awareness of the students.

In this study income [pocket money], age, and perception that smoking makes attractive were not seen significantly associated with adolescent tobacco use which is inconsistent with the study conducted in Nepal [25]. This discrepancy might be attributed to the difference in the study areas and the socio-economic status of the individuals. Since this study is cross sectional survey using GYTS, it might not show cause effect relationship. Therefore we recommend another study in order to establish cause effect relationship and attribution of the factors to tobacco use.

Conclusion and Recommendations

According to the study it is possible to conclude that the prevalence rate is increasing in its spread, the gap between male and female is decreasing and environmental exposure to tobacco smoke is wide spreading. If the current trend is not controlled many of those adolescents who currently smoke would have to endure a life time addiction and may die prematurely from tobacco-related diseases. This study finding also indicated that parent and peer smoking, lack of perception on the

dangers of tobacco use, and exposure to movies whose actors smoking were associated with tobacco use among adolescents. Therefore the government of Ethiopia should legislate, enact, and enforce laws that decrease accessibility of cigarette, totally ban smoking in the public places, and totally prohibit tobacco advertisement and promotions in Medias and movies. Moreover adolescents of the country should be enriched with the knowledge on the dangers of tobacco use.

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References

1. Tobacco free initiative (TFI): Why is tobacco a public health priority?
2. Global Youth Tobacco Survey (GYTS) Ethiopian Fact Sheet.
3. Kebede Y (2002) Cigarette smoking and khat chewing among university instructors in Ethiopia. *East Afr Med J* 79: 274-278.
4. Schoemaker N, Hermanides J, Davey G (2005) Prevalence and predictors of smoking in Butajira town, Ethiopia, 2003. *Ethiop J Health Dev* 19:182-187.
5. Rudatsikira E, Abdo A, Muula AS (2007) Prevalence and determinants of adolescent tobacco smoking in Addis Ababa, Ethiopia. *BMC Public Health* 7: 176.
6. Abdullah AS, Ho WW (2006) What Chinese adolescents think about quitting smoking: a qualitative study. *Subst Use Misuse* 41: 1735-1743.
7. Kassaye M, Taha H, Fissehaye G, Teklu T (1999) Drug use among high school students in Addis Ababa and Butajira. *Ethiop J Health Dev* 13:101-106.
8. Global Youth Tobacco Survey Collaborating Group (2003) Differences in worldwide tobacco use by gender: findings from the Global Youth Tobacco Survey. *J Sch Health* 73: 207-215.
9. CSA: Ethiopia demographic and health survey. Central Statistical Authority of Ethiopia and ORC Macro, Addis Ababa, Ethiopia and Calverton, Maryland, USA; 2010.
10. Deressa W, Azazh A (2011) Substance use and its predictors among undergraduate medical students of Addis Ababa University in Ethiopia. *BMC Public Health* 11: 660.
11. Kassaye M, Sherief TH, Ghimja F, Teklu F (1999): Drug use among school students in Addis Ababa and Butajira. *Ethiopian Journal of Health Development* 13:101-106.
12. Kebede Y (2002) Cigarette smoking and khat chewing among college students in North West Ethiopia. *Ethiopian Journal of Health Development* 16:9-17.
13. Warren CW, Jones NR, Peruga A, Chauvin J, Baptiste J-P, et al. (2008) Global Youth Tobacco Surveillance, 2000-2007. *MMWR* 57: 1-21.
14. Rudatsikira E, Muula AS, Siziya S (2009) Current cigarette smoking among in-school American youth: results from the 2004 National Youth Tobacco Survey. *Int J Equity Health* 8: 10.
15. Tobacco in Australia; facts and issues. Health effects for younger smokers, 2013.
16. Hammond SK1 (2009) Global patterns of nicotine and tobacco consumption. *Handb Exp Pharmacol* : 3-28.
17. World Health Organization (1999) The world health report 1999: making a difference. Geneva: World Health Organization.
18. Shafey O, Dolwick S and Guindon G (2003) Tobacco control country profiles. Atlanta, GA: American Cancer Society, World Health Organization, International Union Against Cancer.
19. Bansal R, John S and Ling PM (2005) Cigarette advertising in Mumbai, India: targeting different socioeconomic groups, women, and youth. *Tobacco Control* 14:201-206.

20. Mackay J, Eriksen M and Shafey O (2006) *The tobacco atlas*, (2nd edn.) Washington: The American Cancer Society and Union International Centre Cancer.
21. Warren C, Jones N, Eriksen M and Asma S (2006) The Global Tobacco Surveillance System (GTSS) collaborative group. Patterns of global tobacco use in young people and implications for future chronic disease burden in adults. *The Lancet* 367:749-753.
22. Yang T, Li F, Yang X, Wu Z, Feng X, et al. (2008) Smoking patterns and sociodemographic factors associated with tobacco use among Chinese rural male residents: a descriptive analysis. *BMC Public Health* 8: 248.
23. Factors related to tobacco use among adolescents ... [J Nurs Res. 2008] - PubMed - NCBI].
24. Pradhan PM, Niraula SR, Ghimire A, Singh SB, Pokharel PK (2013) Tobacco use and associated factors among adolescent students in Dharan, Eastern Nepal: a cross-sectional questionnaire survey. *BMJ Open* 3.
25. (2005) Drug Administration and Control Authority (DACA) of Ethiopia, A Report On Global Youth Tobacco Survey (GYTS). Pp: 20-25.
26. Uganda – Kampala, Global Youth Tobacco Survey (GYTS), FACT SHEET 2002.
27. Eritrea, Global Youth Tobacco Survey (GYTS), FACT SHEET, 2006.
28. Ayalu R., Asmamaw M, Berhanu Y, Sibhatu B (2007) Determinants of cigarette smoking among school adolescents in eastern Ethiopia: a cross-sectional study.
29. Niels S, Jeroen H, Gail D (2005) Prevalence and predictors of smoking in Butajira town. *Ethiop J Health Dev.* 19:182-187.
30. Centers for Disease Control (CDC) (1992) Comparison of the cigarette brand preferences of adult and teenaged smokers--United States, 1989, and 10 U.S. communities, 1988 and 1990. *MMWR Morb Mortal Wkly Rep* 41: 169-173, 179-81.
31. Centers for Disease Control and Prevention (CDC) (1994) Changes in the cigarette brand preferences of adolescent smokers--United States, 1989-1993. *MMWR Morb Mortal Wkly Rep* 43: 577-581.
32. Pollay RW, Siddarth S, Siegel M (1996) The last straw? cigarette advertising and realized market shares among youths and adults, 1979-1993. *J Marketing.* 60: 1-16.
33. Evans N, Farkas A, Gilpin E, Berry C, Pierce JP (1995) Influence of tobacco marketing and exposure to smokers on adolescent susceptibility to smoking. *J Natl Cancer Inst* 87: 1538-1545.
34. Pierce JP, Gilpin E, Burns DM, Whalen E, Rosbrook B, et al. (1991) Does tobacco advertising target young people to start smoking? Evidence from California. *JAMA* 266: 3154-3158.
35. Charlesworth A, Glantz SA (2005) Smoking in the movies increases adolescent smoking: a review. *Pediatrics* 116: 1516-1528.
36. Charlesworth A, Glantz SA (2006) Tobacco and the movie industry. *Clin Occup Environ Med* 5: 73-84, ix.
37. Charlesworth A, Glantz SA (2005) Smoking in the movies increases adolescent smoking: a review. *Pediatrics* 116: 1516-1528.
38. Charlesworth A, Glantz SA (2006) Tobacco and the movie industry. *Clin Occup Environ Med* 5: 73-84, ix.
39. Sargent JD (2005) Smoking in movies: impact on adolescent smoking. *Adolesc Med Clin* 16: 345-370, ix.
40. Dalton MA, Beach ML, Adachi-Mejia AM, Longacre MR, Matzkin AL, et al. (2009) Early exposure to movie smoking predicts established smoking by older teens and young adults. *Pediatrics* 123: e551-558.
41. Hanewinkel R (2009) Cigarette smoking and perception of a movie character in a film trailer. *Arch Pediatr Adolesc Med* 163: 15-18.
42. Tickle JJ, Sargent JD, Dalton MA, Beach ML, Heatherton TF (2001) Favourite movie stars, their tobacco use in contemporary movies, and its association with adolescent smoking. *Tob Control* 10: 16-22.
43. Hanewinkel R (2009) Cigarette smoking and perception of a movie character in a film trailer. *Arch Pediatr Adolesc Med* 163: 15-18.
44. Knowles JH Jr, Wanke KL, Kawachi I (2004) Internet sales of tobacco: heading off the new E-pidemic. *J Public Health Policy* 25: 162-172.
45. National Cancer Institute (2008) Chapter 3: Key principles of tobacco promotion and rationales for regulation. In: *Tobacco Control Monograph 19: The role of the media in promoting and reducing tobacco use*. Bethesda MD: US Department of Health and Human Services, National Institutes of Health, National Cancer Institute.
46. Anderson SJ, Ling PM (2008) "And they told two friends...and so on": RJ Reynolds' viral marketing of Eclipse and its potential to mislead the public. *Tob Control* 17: 222-229.
47. Sultana D (2010) Nielsen uncovers the new digital divide Facebook users vs non-Facebook users Media release. Sydney: Nielsen.