

ORIGINAL ARTICLE

A Cross-sectional Study on Knowledge and Perception About Smoking Tobacco Products Among Students in University of Cyberjaya

Bisyara Nur Ain Mohd Kamaruzaman¹, Mohamad Imran Ismail¹, Rafie' Aniq Abdul Rashid¹, Syamim Irdina Sharizal¹, Dr. Azli Shahril Othman²

¹ Faculty of Medicine, University of Cyberjaya, 63000 Cyberjaya, Selangor, Malaysia

² Department of Pharmacology, Faculty of Medicine, University of Cyberjaya, 63000 Cyberjaya, Selangor, Malaysia

ABSTRACT

Introduction: Annually eight million people around the world are killed by the tobacco epidemic which is regarded as one of the biggest public health issues the world has ever faced. This research is intended to be a source of the latest findings on the prevalence of smokers and the association between smoking status with knowledge, attitude and perception toward tobacco products. **Methods:** This cross-sectional study was done among 221 students in University of Cyberjaya, Malaysia. A self-administered online based questionnaire was adapted from the one used in Global Adult Tobacco Survey (GATS) by the World Health Organization (WHO) and Ministry of Health (MOH), Malaysia. The questionnaire consists of sociodemographic profile, tobacco use habits, knowledge on tobacco products and their stance on local tobacco control initiatives. **Results:** A majority of the respondents were non-smokers (55.7%). There is a high prevalence of smokers among males (66.9%), in respondents aged less than 20 and between 30-39 years old (50.0%), in those of Chinese descent (60.4%), other religions and in widowers/divorcees (100.0%). Regardless of smoking status, all of the respondents agree that consuming tobacco products increases the likelihood of getting heart attack and lung cancer, ($p= 0.460$ and 0.121 respectively). There is also a significant association between smoking status and the knowledge of smokeless tobacco causing serious illnesses ($p=0.027$). The stance of students towards all of the local regulations and actions also shows significant association with their smoking status ($p<0.05$). **Conclusion:** Revisions in legislation and education are needed as there are still differences of knowledge, attitude and behaviour toward tobacco products with smoking status.

Keywords: Smoking, Knowledge, Perception, Students, Cyberjaya

Corresponding Author:

Azli Shahril Othman, MB, BCh, BAO

Email: azli@cyberjaya.edu.my

Tel: +603-83137146

INTRODUCTION

The tobacco epidemic is one of the biggest public health issues the world has ever faced, killing more than 8 million people around the world every year. According to the World Health Organization (WHO), more than 7 million of those deaths result from direct tobacco use while the remaining 1 million come from non-smoker exposure to second-hand smoke (1).

Over 80% of the world's 1.3 billion tobacco users live in low- and middle-income countries. Effective monitoring tracks the extent and character of the tobacco

epidemic and indicates how best to implement policies. Based on WHO, only 1 in 3 countries, representing only 38% of the world population, monitor tobacco use by repeating national representative youth and adult surveys at least once every 5 years (1).

Global Adult Tobacco Survey (GATS) is a nationally representative household survey that was launched in February 2007 as a new component of the ongoing Global Tobacco Surveillance System (GTSS) (2). The GATS enable countries to collect data on tobacco use and key tobacco control measures. The survey also covers the assessment of knowledge, attitude and perception of an individual towards tobacco products. Results from this survey assist countries in the formulation, tracking and implementation of effective tobacco control interventions.

According to GATS Malaysia, majority of adults knew that smoking causes serious illness (92.2%), knew that breathing other people's smoke causes serious illness and diseases in non-smokers (85.8%), knew that indoor smoking should be prohibited in workplaces (90.4%) and favored increasing taxes on tobacco products (70.6%) (3). However, according to WHO, the prevalence of tobacco use in Malaysia is expected to drop to 19.6% by 2025, falling short of Malaysia's goal of 15% under its National Strategic Plan for Non-Communicable Disease 2016-2025 (4).

The latest GATS report from Malaysia was published in 2012. A lot of significant findings were mentioned in the report that have been vital in modelling the public policy approach toward tobacco products. This research was conducted to be a source of the latest results to fill the gap on the prevalence of smokers, knowledge, attitude and perception towards tobacco products among healthcare-based university students which can help shape future public health policies.

MATERIALS AND METHODS

This cross-sectional study was done by convenience sampling via online Google form among 221 students in University of Cyberjaya, Malaysia who met the inclusion criteria of individuals who have consented to be a part of the study and aged more than 18 years old and above with exclusion criteria of individuals who have been diagnosed with psychiatric disorders and individuals with immediate family members working in the tobacco industry. A self-administered online based questionnaire was adapted from the one used in Global Adult Tobacco Survey (GATS) 2011 by the World Health Organization (WHO) and Ministry of Health (MOH), Malaysia. The questionnaire consists of a sociodemographic profile, tobacco use habits, knowledge on tobacco products and their stance on local tobacco control initiatives. Data was tabulated by separating current smokers from non-smokers. The operational definition used for current smokers is a person who currently smokes at least one tobacco product either daily or less than daily, over a period of one month or more as reported by the individual. Association between smoking status and variables were done using Pearson's chi-squared test analysis and exact test done by the IBM SPSS Statistics software version 23.

RESULTS

Most students of the University of Cyberjaya were non-smokers (55.7%) as compared to current smokers (44.3%). The prevalence of current smokers by selected socio-demographic factors among students of University of Cyberjaya revealed that a higher prevalence of current smokers could be seen among male students (66.9%) compared to females (17.0%).

Table I : Prevalence of current smokers by selected socio-demographic factors among students of University of Cyberjaya

Socio-demographic factor	Smoking status		Total n (%)
	Yes n (%)	No n (%)	
Current students	98 (44.3)	123 (55.7)	221 (100)
Gender			
Male	81 (66.9)	40 (33.1)	121 (100)
Female	17 (17)	83 (83)	100 (100)
Age			
<20	15 (50)	15 (50)	30 (100)
20-29	79 (43.2)	104 (56.8)	183 (100)
30-39	4 (50)	4 (50)	8 (100)
Race			
Malay	49 (36)	87 (64)	136 (100)
Chinese	29 (60.4)	19 (39.6)	48 (100)
Indian	18 (58.1)	13 (41.9)	31 (100)
Others	2 (33.3)	4 (66.7)	6 (100)
Religion			
Islam	47 (34.1)	91 (65.9)	138 (100)
Buddhism	23 (67.6)	11 (32.4)	34 (100)
Christianity	16 (57.1)	12 (42.9)	28 (100)
Hinduism	11 (55)	9 (45)	20 (100)
Others	1 (100)	0 (0)	1 (100)
Marital status			
Single	93 (44.1)	118 (55.9)	211 (100)
Married	4 (44.4)	5 (55.6)	9 (100)
Widowed/divorced	1 (100)	0 (0)	1 (100)

According to the age group, the prevalence was highest for the groups of less than 20 years old and between 30 to 39 years old, both at 50.0%. This study also showed that the race with the highest prevalence of current smokers was Chinese (60.4%) followed by Indian (58.1%), Malay (36.0%) and other races (33.3%). The highest prevalence of current smokers was from other religion (100.0%) followed by Buddhist (67.6%), Christian (57.1%), Hindu (55.0%) and Muslim (34.1%). Widowed/divorced students have the highest prevalence of current smokers (100.0%) followed by married (44.4%) and single (44.1%).

Next, the study showed that the knowledge of tobacco causing serious illnesses was significantly associated with smoking status with a p-value of 0.009. Only a minority of smokers (6.1%) and non-smokers (0.8%) do not agree that smoking causes serious illness.

Table II : Prevalence and association of University of Cyberjaya students' knowledge/belief that smoking tobacco causes serious illness with smoking status

Knowledge/belief that smoking tobacco causes	Current smoker			Non-smoker			Chi value (d.f.)	p-value
	Yes, n (%)	No, n (%)	Don't know, n (%)	Yes, n (%)	No, n (%)	Don't know, n (%)		
Serious illness	92 (93.9)	6 (6.1)	0 (0)	117 (95.1)	1 (0.8)	5 (4.1)	-	0.009(*)
Stroke	81 (82.7)	11 (11.2)	6 (6.1)	117 (95.1)	1 (0.8)	5 (4.1)	12.299 (2)	0.002
Heart attack	90 (91.8)	4 (4.1)	4 (4.1)	118 (95.9)	2 (1.6)	3 (2.4)	-	0.46(*)
Lung cancer	94 (95.9)	4 (4.1)	0 (0)	120 (97.6)	1 (0.8)	2 (1.6)	-	0.121(*)
Oral cancer	83 (84.7)	12 (12.2)	3 (3.1)	119 (96.7)	1 (0.8)	3 (2.4)	-	<0.001(*)
Premature birth	57 (58.2)	26 (26.5)	15 (15.3)	115 (93.5)	1 (0.8)	7 (5.7)	43.342 (2)	<0.001
Throat cancer	83 (84.7)	12 (12.2)	3 (3.1)	118 (95.9)	1 (0.8)	4 (3.3)	-	0.001(*)
Miscarriage	61 (62.2)	20 (20.4)	17 (17.3)	115 (93.5)	1 (0.8)	7 (5.7)	35.552 (2)	<0.001
Gangrene	61 (62.2)	24 (24.5)	13 (13.3)	77 (62.6)	13 (10.6)	33 (26.8)	11.135 (2)	0.004
Bladder cancer	58 (59.2)	30 (30.6)	10 (10.2)	95 (77.2)	7 (5.7)	21 (17.1)	24.635 (2)	<0.001
Stomach cancer	58 (59.2)	31 (31.6)	9 (9.2)	90 (73.2)	12 (9.8)	21 (17.1)	17.510 (2)	<0.001
Osteoporosis	48 (49.0)	31 (31.6)	19 (19.4)	62 (50.4)	17 (13.8)	44 (35.8)	13.126 (2)	0.001

*Exact test

Table III : Association of knowledge on cigarette addiction and smokeless tobacco causing serious illness with smoking status

	Yes, n (%)	No, n (%)	Don't know, n (%)	Chi value (d.f.)	p-value
Knowledge that cigarettes are addictive					
Smoker	91 (92.9)	6 (6.1)	1 (1.0)	-	0.068(*)
Non-smoker	119 (96.7)	1 (0.8)	3 (2.4)		
Knowledge that "smokeless tobacco" causes serious illness					
Smoker	77 (78.6)	17 (17.3)	4 (4.1)	7.217 (2)	0.027
Non-smoker	102 (82.9)	9 (7.3)	12 (9.8)		

*Exact test

Table IV : Association of support for regulations and MOH anti-smoking actions with smoking status

	Support, n (%)	Oppose, n (%)	Don't know, n (%)	Chi value (d.f.)	p-value
Regulations regarding cigarette or tobacco products					
Tax increase on tobacco product					
Smoker	51 (52.0)	37 (37.8)	10 (10.2)	66.636 (2)	<0.001
Non-smoker	120 (97.6)	0 (0.0)	3 (2.4)		
Prohibition of the display of cigarette or tobacco products at point-of-sale					
Smoker	53 (54.1)	35 (35.7)	10 (10.2)	42.310 (2)	<0.001
Non-smoker	112 (91.1)	5 (4.1)	6 (4.9)		
Restriction of sales on cigarette and tobacco products by licensing retailers					
Smoker	53 (54.1)	33 (33.7)	12 (12.2)	48.851 (2)	<0.001
Non-smoker	114 (92.7)	2 (1.6)	7 (5.7)		
Ministry of Health's anti-smoking actions					
Prohibit smoking in public places					
Smoker	49 (50.0)	42 (42.9)	7 (7.1)	42.022 (2)	<0.001
Non-smoker	110 (89.4)	11 (8.9)	2 (1.6)		
Increase the number of no-smoking zones					
Smoker	51 (52.0)	42 (42.9)	5 (5.1)	-	<0.001(*)
Non-smoker	108 (87.8)	12 (9.8)	3 (2.4)		
Increase price of cigarettes					
Smoker	67 (68.4)	25 (25.5)	6 (6.1)	15.242 (2)	<0.001
Non-smoker	110 (89.4)	10 (8.1)	3 (2.4)		
Increase tax on cigarettes					
Smoker	65 (66.3)	30 (30.6)	3 (3.1)	24.352 (2)	<0.001
Non-smoker	110 (89.4)	7 (5.7)	6 (4.9)		
Have more anti- smoking campaigns					
Smoker	52 (53.1)	33 (33.6)	13 (13.3)	17.205 (2)	<0.001
Non-smoker	97 (78.9)	21 (17.1)	5 (4.1)		
Make selling of cigarette illegal					
Smoker	59 (60.2)	33 (33.7)	6 (6.1)	11.722 (2)	0.003
Non-smoker	87 (70.7)	19 (15.5)	17 (13.8)		
Impose higher fine on smoking related offences					
Smoker	57 (58.2)	28 (28.6)	13 (13.3)	29.030 (2)	<0.001
Non-smoker	110 (89.4)	8 (6.5)	5 (4.1)		
Provide more quit smoking services					
Smoker	59 (60.2)	21 (21.4)	18 (18.4)	25.222 (2)	<0.001
Non-smoker	109 (88.6)	5 (4.1)	9 (7.3)		

Knowledge that smoking causes stroke, oral cancer, premature birth, throat cancer, miscarriage, gangrene, bladder cancer, stomach cancer, and osteoporosis showed significant association with smoking status ($p < 0.05$) while only heart attack and lung cancer showed no association with smoking status ($p > 0.05$).

This study found that knowledge of smokeless tobacco causing serious illness was significantly associated with smoking status ($p < 0.05$). The support for regulations of tobacco products was also significantly associated with smoking status ($p < 0.05$). The regulations include a tax increase on tobacco products, prohibition of the display of cigarette or tobacco products at point-of-sale and restriction of sales on cigarette and tobacco products by licensing retailers.

This research also showed that support for all Ministry of Health's anti-smoking actions was significantly associated with smoking status ($p < 0.05$).

DISCUSSION

From this study, the prevalence of current smokers in University of Cyberjaya was double than in Malaysians aged 15 years and above as per the study conducted by the National Health and Morbidity Survey in 2015 (22.8%) (5). The study by NHMS was done on a nationally representative scale. Meanwhile, this study was focused on university students where factors such as steady income from parents, peer pressure and simply being free from observation of the parents or guardians contribute to this higher percentage (6).

These study results were similar to the study done among students and staff in Universiti Putra Malaysia by Sharker (2005) where the prevalence of male smokers was higher (28.1%) compared to females (2.0%) (7). This study believed that gender stigmatization of smoking still exists in society (8). However, the percentage of female smokers was much higher in this study. Since the introduction of electronic cigarettes with different flavours were introduced into the market, the female gender tends to be more attracted to using it. They may not be smoking cigarettes but still smoke using electronic cigarettes with a variety of sweet flavours that can be obtained easily in the open market (9).

This study differed from the study by NHMS where the age group less than 20 years old had the lowest prevalence of smokers (13.2%) (5). The highest prevalence according to the aforementioned study was in the age group of 35-39 years old (17.4%) (5). Compared to this study, NHMS study was done in the

general population where various age groups were part of the study whereas this study involves university going students where the range of age groups was limited.

In contrast with this study, GATS Malaysia 2011 showed that the highest prevalence of current smokers were other races (30.0%) while the lowest prevalence was Chinese (15.4%) (3). This study believed that this was due to the majority of Chinese students in University of Cyberjaya being male students, which contributed to the higher prevalence of current smokers among the Chinese in this study.

This study was in contradiction with GATS Malaysia 2011 that showed the highest prevalence of smokers was Islam (25.6%) (3). The reason is GATS Malaysia 2011 was using a nationally representative sample of the population in Malaysia compared to this study.

This study was in contrast with the study done on pharmacy students from International Islamic University Malaysia (IIUM) by Jamshed (2018), where the highest were among single (98.0%) and lowest were among the widowed/divorced group (0%) (10).

Similar studies conducted by Al-Haqwi (2009) in two medical colleges in Riyadh showed that the majority of students agree that smoking causes serious illness (11). Another study done in Vietnam by Nguyen (2020) also showed that the prevalence of students agreed that smoking tobacco can cause serious illness (12). GATS Malaysia, 2011 showed that 92.2% of adults in Malaysia believed that smoking causes serious illness (3). The results from all three studies were consistent as they were all conducted among university students whose higher education level could lead to increased awareness of the bad effect of smoking.

This study was in line with the study done by GATS Malaysia 2011 that showed around 88.1% of smokers and 19.9% of non-smokers agree that tobacco smoking causes the aforementioned conditions (3). Results from a study conducted by Al-Naggar on Malaysian university students also showed that around 66.4% of non-smokers and almost 50% of smokers agree that cigarettes contain more than 40 cancer agents (13). The same study also showed that 76.5% of smokers and 90.0% of non-smokers knew that exposure to cigarette smoke can cause miscarriage (13).

Among all the serious illnesses that can be caused by smoking, only the knowledge of smoking causing heart attack and lung cancer showed non statistically significant association with smoking status. The main reason that gave rise to the awareness of

complications of smoking such as heart attack and lung cancer not stroke, oral cancer, throat cancer, premature birth, miscarriage, gangrene, bladder cancer, stomach cancer or osteoporosis was because of only certain and common diseases are widely mentioned in anti-smoking campaigns. Diseases in the latter group were not commonly mentioned as a complication of smoking. Thus, fewer students were aware of the diseases (14).

This study showed that the prevalence of student's knowledge that tobacco cigarettes are addictive was the highest in non-smokers who knew that cigarettes are addictive while the lowest in current smokers who do not know that cigarettes are addictive. This may be due to non-smokers being well aware of the downside of smoking that it can cause addiction (15). However, there was no significant association between knowledge that cigarettes are addictive and smoking status.

Smokers had the wrong idea that smokeless tobacco is safer than smoking and they believe that smokeless tobacco can help them to eventually quit smoking (16). There was a significant association between knowledge that smokeless tobacco causes serious illness and smoking status.

In agreement with GATS Malaysia 2011, a majority of smokers and non-smokers agreed on the regulations imposed towards tobacco products (3).

This study showed similarity with GATS Malaysia that revealed 70.6% of adults in Malaysia favoured increasing taxes on tobacco products (3). The evidence had shown increasing the price of tobacco through higher taxes is the single most effective way to encourage tobacco users to quit and prevent children from starting to smoke (3).

This study was in accordance with the study done by GATS Malaysia 2011 in which smokers (83.6%) and non-smokers (92.4%) both believed in the action of prohibiting smoking in public places (3). Similar to the study conducted by Al-Naggar which showed that almost 50% of smokers and majority of non-smokers (94.3%) agreed that smoking should be banned in public places (13). These were of the opinion that the action can reduce the number of current smokers. Most smokers and non-smokers were also of the opinion that increasing the number of no-smoking zones can reduce the prevalence of current smokers.

Both smokers and non-smokers support increasing the price of cigarettes at 68.4% and 89.4%, respectively, as well as increasing the tax of cigarettes at 66.3% and 89.4%, respectively. This may be due to the higher price of cigarettes being harder for smokers to attain and continue its usage while it also acts as a disincentive

for smoking in the youth, young adults and low socio-economic status (13). As the majority agree, raising the price and tax on cigarettes is a feasible policy option to reduce smoking rates.

Both this study and another study done by the American Public Health Association are in concordance that the odds of having a smoker quit increased by 11% in instances involving anti-smoking campaigns (OR: 1.11, 95% CI:1.00-1.23). This may be due to the emotionally evocative ways campaigns successfully reach out to smokers about the effects of smoking (17). The results for making the selling of cigarettes illegal were in accordance with the study done by GATS Malaysia 2011 that showed the overall population (75.6%) favoured prohibiting the display of cigarettes at points-of-sale (3). This can be due to the avoidance of it being another channel of promotion for cigarette selling (18).

This study was in agreement with a study done in England that showed an effective quit smoking service managed to reduce the prevalence of smokers by 10.8% (19). This may be due to the counselling and treatments offered that are efficacious in curbing smoking (18). These services should be strengthened as the majority favoured these quit-smoking clinics.

CONCLUSION

Even though the prevalence of smokers among students in the University of Cyberjaya was lower than non-smokers, it was still much higher than the national prevalence. This is a concern as University of Cyberjaya is a health based higher institute of learning. The study revealed the need to revise the health education messages in the anti-smoking campaign as there was a lack of knowledge on the effect of smoking on a wide range of diseases. We also urge policy makers to strengthen regulations and their enforcement to reduce the prevalence of smokers in Malaysia especially among university students.

One limitation of this study is the lack of a scoring system to quantify the level of knowledge and perception. A revision on this part of the study may help classify the level appropriately. The unequal distribution of sociodemographic factors in University of Cyberjaya such as age group, race, religion and marital status also contribute to bias in the population sampled.

However, this study filled the gap by focusing on the level of knowledge and perception about smoking tobacco products among health based university students in Malaysia.

Global Adult Tobacco Survey (GATS) Malaysia was done last in 2011. It should be continued and done

as per the frequency recommended by the World Health Organization (WHO) as it serves as an evidence base to strengthen tobacco control initiative in the country and authoritative reference source for policy makers, stakeholders, public health professionals and others concerned with tobacco control in Malaysia.

ACKNOWLEDGEMENT

We acknowledge and are grateful for the help given by the lectures of the University of Cyberjaya. We are also acknowledging the students of the University of Cyberjaya who were willing to be the respondents of our study.

The approval and ethical clearance from the University of Cyberjaya Research Ethics Review Committee (CRERC) was granted upon commencement of this research project. [CRERC Reference Number: UOC/CRERC/ER/53].

REFERENCES

1. WHO Tobacco Fact Sheet [Internet]. World Health Organization; 2020 [cited 2021 May 4]. Available from: <https://www.who.int/news-room/fact-sheets/detail/tobacco>
2. Global Adult Tobacco Survey (GATS) [Internet]. World Health Organization; 2018 [cited 2021 May 4]. Available from: <https://www.who.int/tobacco/surveillance/survey/gats/en/>
3. Institute for Public Health. Report of the global adult tobacco survey (GATS) Malaysia: Ministry of Health Malaysia; 2012.
4. Ministry of Health. National strategic plan for non-communicable disease (NSP-NCD). Ministry of Health Malaysia; 2012.
5. Institute for Public Health. National health and morbidity survey 2015. Non-communicable diseases, risk factors & other health problems. Volume 2. Malaysia: Ministry of Health; 2015.
6. Nasser A, Zhang X. Knowledge and factors related to smoking among university students at Hodeidah University, Yemen. *Tob Induc Dis*. 2019;16;17:42.
7. Md. Numan, Sharker. Knowledge, attitude and practice on smoking among students and staff in Universiti Putra Malaysia. 2005.
8. Antin T, Annechino R, Hunt G, Lipperman-Kreda S, Young M. The gendered experience of smoking stigma: implications for tobacco control. *Crit Public Health*. 2017;27(4):443-454.
9. Ashford K, Rayens E, Wiggins A, Rayens M, Fallin A, Sayre M. Advertising exposure and use of e-cigarettes among female current and former tobacco users of childbearing age. *Public Health Nurs*. 2017;34(5):430-436.
10. Jamshed, Shazia. Knowledge, attitude and practice of smoking among pharmacy students: Findings from a public university. *Journal of Clinical and Diagnostic Research*. 2018;12: 6-9.
11. Al-Haqwi Al, Tamim H, Asery A. Knowledge, attitude and practice of tobacco smoking by medical students in Riyadh, Saudi Arabia. *Ann Thorac Med*. 2010;5(3):145-8.
12. Nam PT, Tung PT, Dung NH, An DH, Anh BDT, Diep QB, et al. Prevalence of smoking among health science students in Vietnam in 2018 and associated factors: a cross-sectional study. *Health Psychology Open*. 2020;7(2).
13. Al-Naggar RA, Al-Dubai SA, Al-Naggar TH, Chen R, Al-Jashamy K. Prevalence of smoking and associated factors among Malaysian University students. *Asian Pac J Cancer Prev*. 2011;12(3):619-24.
14. Ahluwalia IB, Smith T, Arrazola RA, Palipudi KM, Garcia de Quevedo I, Prasad VM, Commar A, Schotte K, Garwood PD, Armour BS. Current tobacco smoking, quit attempts, and knowledge about smoking risks among persons aged ≥ 15 years - Global Adult Tobacco Survey, 28 Countries, 2008-2016. *MMWR. Morbidity and mortality weekly report*. 2018;67(38):1072-1076.
15. Panda R, Venkatesan S, Persai D, Trivedi M, Mathur MR. Factors determining intention to quit tobacco: exploring patient responses visiting public health facilities in India. *Tobacco induced diseases*. 2014;12(1):1.
16. Li Q, Dresler C, Heck JE, Allwright S, Haglund M, Sanchez S, Kralikova E, Stucker I, Tamang E, Gritz ER, Hashibe M. Knowledge and beliefs about smoking and cancer among women in five European countries. *Cancer Epidemiol Biomarkers Prev*. 2010;19(11):2811.
17. Bader P, Boisclair D, Ferrence R. Effects of tobacco taxation and pricing on smoking behavior in high risk populations: a knowledge synthesis. *International Journal of Environmental Research and Public Health*. 2011;8(11):4118-4139.
18. Durkin SJ, Biener L, Wakefield MA. Effects of different types of antismoking ads on reducing disparities in smoking cessation among socioeconomic subgroups. *American Public Health Association*. 2009;99(12):2217-2223.
19. Jamrozik K. Population strategies to prevent smoking. *BMJ*. 2004;328(7442):759-762.
20. Song F, Elwell-Sutton T, Naughton F. Impact of the NHS stop smoking services on smoking prevalence in England: a simulation modelling evaluation. *Tobacco Control BMJ Journals*. 2020;29:200-206.