Sri Lanka Journal of Medicine **SLJM**

Original Research

Citation: Rambukwella HWSR[1],Dissanayake DS[2], 2024. Prevalence of tobacco smoking and the knowledge and attitudes on prevention of tobacco smoking among schooling adolescents in the age group of 13 – 15 years in the Kandy district in 2018. Sri Lanka Journal of Medicine, pp 23-31.
DOI: https://doi.org/10.4038/sljm.v33i1.408

Prevalence of tobacco smoking and the knowledge and attitudes on prevention of tobacco smoking among schooling adolescents in the age group of 13 – 15 years in the Kandy district in 2018

HWSR Rambukwella[1], DS Dissanayake[2]

[1]Postgraduate Institute of Medicine, University of Colombo.
[2]Department of Community Medicine, Faculty of Medicine, University of Peradeniya.

Correspondence:
HWSR Rambukwella
E mail: roshanrambukwella1@gmail.com
https://orcid.org/0000-0001-7560-6865

ABSTRACT

Introduction: The early age of tobacco smoking initiation among adolescents reported in Sri Lanka highlights the need to initiate tobacco prevention at a very young age.
Objectives: To determine the prevalence of tobacco smoking, the knowledge, and attitudes on prevention of tobacco smoking among schooling adolescents in government schools in the age group of 13-15 years in the Kandy district in 2018.
Methodology: A cross-sectional study was conducted among 1395 students in selected government schools in the Kandy district. The subjects were selected using a stratified multi-stage cluster sampling method. A pretested self-administered questionnaire was used.
Results: The response rate was 97.1%. The Prevalence of ever tobacco smoking in the age group of 13 to 15 years, was 6.02% (95% CI, 4.83% - 7.40%). The prevalence of current smokers was 4.16% (3.23% - 5.24%). Satisfactory knowledge of the harmful effects of tobacco smoking was shown by 49.6% (n=692) of ever smokers. The majority (71.5%, n=997) showed favourable attitudes towards the prevention of smoking. There was a higher likelihood of smoking among students who had unsatisfactory knowledge (OR = 8.203; 95% CI = 4.142 – 16.247) and attitudes (OR=1.172; 95% CI=1.112 – 1.225) compared to students who had satisfactory knowledge and attitudes.
Conclusions: The prevalence of tobacco smoking in the selected age group was high in the Kandy district compared to the national rates. School interventions should target more students who already smoke to improve their knowledge and attitudes.

Keywords: Tobacco smoking, prevalence, knowledge, attitudes, adolescents

Received: 2023-03-06 **Accepted revised version: 2024-02-21** **Published: 2024-03-22**

INTRODUCTION

Tobacco consumption is a global pandemic (1). In 2011, the annual death toll from tobacco smoking reached six million, with projections estimating that by 2030, the number is anticipated to rise to eight million per year. (1). By 2030, it is anticipated that seven out of every ten deaths attributed to tobacco will occur in developing countries (2). Around 25 million adolescents aged 13 to 15 worldwide are estimated to engage in tobacco smoking (3). It shows that among teens in the age group of 13 – 15 years, about one in five smokes worldwide. The public health challenges posed by smoking can be attributed to two main factors: a widespread prevalence and the harmful health effects it induces. The influence of tobacco smoking on public health goes beyond its direct impact on individual smokers and their well-being, encompassing broader effects on economic, environmental, and social aspects. Studies indicate that individuals who initiate smoking during adolescence and continue into adulthood face a heightened risk of premature death from diseases associated with tobacco smoking, with one-third of such adult smokers falling into this high-risk category (4). This underscores the reality that even a modest prevalence of smoking among adolescents can lead to significant societal harm (4). In Sri Lanka, a recent Global Youth Tobacco Survey (GYTS) conducted in 2015 revealed, that the prevalence of current tobacco smoking among adolescent males was 3.2% (95% CI=2.6-4.5), and among females, it was 0.2% (95% CI=0.1-0.8) with the overall prevalence of current smoking of 1.7% (5). In Sri Lanka, ever cigarette smokers among males aged between 13-15 years were 10.0% (95% CI=5.9-16.4), and among females, it was 1.4% (95% CI=0.6-3.5) with an overall prevalence of 5.7% (95% CI=3.5-9.0) (5). Although Sri Lanka has imposed several regulations on selling tobacco products, banning promotions through media, prohibiting smoking in public places, and pictorial warnings on product packages by the NATA act from 2006 onwards, with tobacco prevention, being taught at schools, still the current smoking prevalence among adolescents fluctuates around 2 – 5% (5). However, compared to other developing countries especially in the South Asian region, Sri Lanka has maintained a reasonably low prevalence rate throughout the last decade (5).

A strong correlation has been established between inadequate knowledge and negative attitudes towards tobacco smoking, and elevated prevalence rates of tobacco use among adolescents (6). According to the GYTS survey conducted in Sri Lanka in 2011, 41% of adolescents aged 13 to 15 demonstrated satisfactory knowledge and attitudes regarding the prevention of tobacco smoking, with a 95% confidence interval of 37% to 43%. (7). While the reported figure is relatively high, GYTS surveys conducted in developed countries indicate even higher levels of knowledge and positive attitudes. For instance, in Australia, the percentage stands at 82% (5). They have attained this level of awareness among adolescents by employing comprehensive strategies for tobacco prevention, which include interventions implemented in school settings. While Sri Lanka has conducted surveys on adolescent tobacco use, the execution of preventive measures against tobacco among this demographic has been less robust compared to other nations (5). The objective of this study was to determine the prevalence of tobacco smoking, and the knowledge, and attitudes on the prevention of tobacco smoking among schooling adolescents in government schools in the age group of 13-15 years in the Kandy district in 2018. This study provides current tobacco smoking status among schooling adolescents and will provide the necessary guidance to deciding the implementation of novel strategies for the prevention of tobacco smoking in this important age group.

METHODOLOGY

This was a cross-sectional study. The research was carried out using a representative sample drawn from all government sector schools in the Kandy district which have Grades 8 and 9 (Students of the age group of 13 – 15 years). A multistage stratified cluster sampling technique was used to select grade 8 and 9 students. Schools were stratified based on their functional types, using the most recent registry available (8). As the probability proportionate to the size of the population technique was considered to select subjects from schools, this ensured the representation of all

types of schools as well as the representation of an adequate number from each category. The minimum sample size for the study was calculated using the formula for calculating a population proportion with absolute precision and it was 1427 (9). A class of students in grades 8 and 9 in government schools was considered a cluster. There is significant variability in the student numbers for Grade 8 and Grade 9 classes among different types of schools. Therefore, the cluster size was determined according to the category of school. In the final sample, there were 789 students from type 1AB schools which included 22 clusters. 463 students from Type 1C schools from 21 clusters and 143 students from Type 2 schools from 8 clusters proportionate to the total student population of each type of school in the Kandy district.

A self-administered structured questionnaire was used to collect data. Previous questionnaires used in international, regional, and local studies were used to design the questionnaire (1,5,6,7), and content validity was assured using the modified Delphi technique.

The prevalence of tobacco smoking among schooling adolescents aged 13-15 years in the Kandy district was calculated with a 95% confidence interval. Scores on knowledge were calculated using a three-point scale. Each question had 3 choices as answers (no, yes, or don't know) including both negative and positive responses and given equal weight. The scores on attitudes were calculated using a 5-point scale and each question had 5 choices namely, strongly agree, agree, do not know, disagree, and strongly disagree. Composite scores were calculated for knowledge and attitudes. Knowledge scores were categorized as poor knowledge (score < 50%), average knowledge (score 51–69%) and good knowledge (score ≥ 70%). Attitude scores were categorized as unfavourable attitude (score< 50%), favourable attitude (score 51–69%), and highly favourable attitude (score ≥70%). These cut-offs were decided according to the previous literature (5, 6). Since having good knowledge is important in the prevention of tobacco smoking, for further analysis average and poor knowledge categories were amalgamated into one category as "unsatisfactory." This resulted in two categories namely "satisfactory" and "unsatisfactory." Likewise, categories of favourable and highly favourable attitudes were amalgamated as "Favourable" resulting in two categories namely "Favorable" and "Unfavorable". (Table 5)

RESULTS

The final study sample considered for analysis was 1395. The response rate was 97.77%. The basic socio-demographic characteristics of the study sample are shown in Table 1.

Table 1: The Socio-Demographic Characteristics of the Sample

Characteristic	Frequency (%)
Sex (n=1395)	
Male	738 (52.9)
Female	657 (47.1)
Ethnicity* (n=1379)	
Sinhala	1020 (74.0)
Tamil	233 (16.9)
Muslim	126 (9.1)
Religion* (n=1382)	
Buddhism	970 (70.2)
Hindu	223 (16.1)
Islam	125 (9.0)
Christian	64 (4.7)

The education level of the father* (n=1369)	
Educated from Grade 1 up to GCE O\L	156 (11.4)
Educated beyond GCE O\L	1213 (88.6)
The education level of the mother* (n=1372)	
Educated from Grade 1 up to GCE O\L	204 (14.9)
Educated beyond GCE O\L	1168 (85.1)
Social class (n=1395)**	
Social class I	375 (26.9)
Social class II	471 (33.8)
Social class III	273 (19.6)
Social class IV	202 (14.5)
Social class Va	54 (3.8)
Social class Vb	20 (1.4)

*Total is less than 1395 due to missing values

**The social class of the family was categorized according to Barker and Hall's social class classification (10). Social class I: Professional, managerial and technical officer, social class II: Teacher, nurse, health worker and business owners, social class III: Armed forces, police, clerk and shop keeper, social class IV: Farmer, estate worker and skilled labourer, social class Va: Petty traders, Hawkers and semi-skilled labourer, social class Vb: Not employed.

The prevalence of types of smokers are described in Table 2. The Prevalence of ever smokers among students in government schools in the age group of 13 to 15 in the Kandy district was 6.02% (n=84, 95% CI, 4.83% - 7.40%).

Table 2: Prevalence of Smoking among Students in Government Schools in the Age Group of 13 to 15 Years in Kandy District (n=1395)

Type of smoker*	Frequency (n)	Prevalence (95% Confidence Interval)
Ever smokers	84	6.02% (4.83% - 7.40%)
Current smokers	58	4.16% (3.23% - 5.24%)
Past smokers	17	1.22% (0.76% - 1.94%)
Quitters	9	0.65% (0.34% - 1.22%)
Never smokers	1311	93.98% (92.61% - 95.11%)

*Type of smoker was defined according to the definitions given by the World Health Organization in GYTS 2015 (5)

Table 3: Stems on knowledge and attitudes towards prevention of tobacco Smoking and percentage responses for each stem by the subjects

Stem on knowledge	Knowledge status		Stem on attitude	Attitude status	
	Satisfactory (%)	Unsatisfactory (%)		Favourable (%)	Unfavourable (%)
KS1 Hazards of tobacco smoking are not well documented.	1237 (88.7)	158 (11.3)	**AS1** People who smoke tobacco are not popular among friends	1085 (77.7)	310 (22.3)
KS2 Tobacco use is the single most preventable cause	1046 (75.0)	349 (25.0)	**AS2** Tobacco smoking is a way for	1352 (96.9)	43 (3.1)

of death in the world.			people to express their independence.		
KS3 Smoking causes constipation	933 (66.9)	462 (33.1)	**AS3** A young person who smokes is more attractive than one who does not.	1332 (95.5)	63 (4.5)
KS4 Smoking during pregnancy carries a risk of adverse effects on the health of the baby	925 (66.3)	470 (33.7)	**AS4** Having pictorial messages that depict the harmful effects of smoking on cigarette packets will discourage smoking.	1015 (72.8)	380 (27.2)
KS5 Anyone who starts tobacco smoking carries a risk of becoming addicted.	837 (60.0)	558 (40.0)	**AS5** Smoking should be banned as it is religiously unacceptable	1263 (90.6)	132 (9.4)
KS6 Nicotine in tobacco causes cancer.	809 (58.0)	586 (42.0)	**AS6** Quitting the tobacco smoking habit is not easy.	1332 (95.5)	63 (4.5)
KS7 There is no safe way to smoke tobacco.	866 (62.1)	529 (37.9)	**AS7** Smoking should be banned inside enclosed public places	1062 (76.1)	333 (23.9)
KS8 Smoking is most likely to become a habit if commenced during the teen years.	974 (69.8)	421 (30.2)	**AS8** Censoring pro-tobacco scenes in visual electronic media (eg: Television) reduces school children experimenting with tobacco smoking	924 (66.2)	511 (33.8)
KS9 Smoking does not carry any beneficial effects to your health	1011 (72.5)	384 (27.5)	**AS9** Sports events at schools (eg: Sports meets, big matches) provide more opportunities to experiment with tobacco smoking	904 (64.8)	491 (35.2)
KS10 If a person has smoked a pack of cigarettes a day for more than 20 years, there is little health benefit of quitting smoking.	524 (37.6)	871 (62.4)	**AS10** If your best friend is going to provide you with a cigarette you are going to smoke	1366 (97.9)	29 (2.1)

KS – Knowledge stem, AS - Attitude stem

Frequency distributions of students according to knowledge and attitudes are described in Table 4.

Table 4: Strata of students according to knowledge and attitudes on tobacco Smoking

Knowledge of tobacco smoking	**Frequency (%)**
Good	692 (49.6)
Average	555 (39.8)
Poor	148 (10.6)
Total	1395 (100.0)
Attitudes towards prevention of tobacco smoking	
Highly favourable	113 (8.1)
Favourable	884 (63.4)
Unfavourable	398 (28.5)
Total	1395 (100.0)

Good knowledge of the harmful health effects of tobacco smoking was found among 49.6% (n=692). However, only 58% (n=809) knew that nicotine in tobacco causes cancer and only 37.6% (n=524) were aware that quitting smoking even after 20 years of smoking would benefit health. During further analysis, it was found that only 45.2% (n=38) of the ever smokers knew tobacco smoking causes constipation. Also, among female students, only 47.3% (n= 440) knew that tobacco smoking carries a risk in pregnancy.

There was a higher likelihood of smoking among students who had unsatisfactory knowledge compared to students who had satisfactory knowledge (OR = 8.203; 95% CI = 4.142 – 16.247; p < 0.0001).

When analyzing the responses given by students, five stems in the attitudes section responded with the response of "Don't know" more than 20% of the students (AS2, AS3, AS4, AS8, and AS9). Responses to stem 6 (AS6) elaborate that 24.3% of students had not decided whether quitting the habit of smoking is easy or not. Out of those who responded to the second stem (AS2), further analysis showed that 29.3% of male students either agreed or not decide on a negative self-image created by smoking. The responses to the final stem (AS10) showed that 19.1% have not decided whether to smoke if their best friend offers a cigarette. Further details are added as supplementary tables (Supplementary Tables I and II).

Students who had unfavourable attitudes had a higher likelihood of smoking compared to those who did not have unfavourable attitudes (OR=1.172; 95% CI=1.112 – 1.225; p < 0.0001).

Table 5: Association of Knowledge and Attitudes towards Tobacco Smoking with Smoking Status (n=1395)

Knowledge	**Ever smokers n (%)**	**Never smokers n (%)**	**Total n (%)**	**Odds ratio (95% CI) P-value**
Unsatisfactory	75 (10.7)	628 (89.3%)	703 (100.0%)	8.203 (4.142 – 16.247) P < 0.0001
Satisfactory	9 (1.3%)	683 (98.7%)	692 (100.0%)	
Total	84 (6.0%)	1311 (94.0%)	1395 (100.0%)	
Attitudes				
Unfavourable	65 (16.3%)	333 (83.7%)	398 (100.0%)	1.172 (1.122 – 1.225) P < 0.0001
Favourable	19 (1.9%)	978 (98.1%)	997 (100.0%)	
Total	84 (6.0%)	1311 (94.0%)	1395 (100.0%)	

DISCUSSION

Assessing the prevalence of tobacco smoking regularly is crucial as it is subjected to fluctuates with time. Global Youth Tobacco surveys conducted in the past in Sri Lanka had shown the prevalence fluctuating from as low as 5.1% in 2007 to as high as 12.1% in 1999 (5). Therefore, vigilance on the prevalence of tobacco smoking is important from a public health perspective.

In the Kandy district, the prevalence of tobacco smoking among individuals aged 13 to 15 years was 6.02% (95% CI, 4.83 - 7.40). This was higher than the reported prevalence in GYTS conducted in 2015 (5.7%; 95% CI=3.5-9.0). The GYTS was conducted with a sample size of 1500 students from government schools representing the whole country. However, the survey report did not address the adequacy of the sample size (5). The prevalence of current smokers, which is the most important indicator to consider when discussing prevalence of smoking in a specific population, was higher in the current study (4.16%; 95% CI, 3.23 - 5.24) compared to that of GYTS 2015 (1.7%). Since definitions of smokers were the same used in the GYTS surveys the estimates could be compared. Senanayake et al11 reported a current smoking prevalence of 2.5% (95% CI, 1.6-3.9) in the same age group (13 – 15 years) in their study conducted in 2016 (11). The above study was conducted among 3650 students representing government schools from all districts of Sri Lanka which is more generalizable to the country. Despite existing regulations aimed at restricting the sale of tobacco products to adolescents, all students participating in these surveys who reported tobacco use were below the age of 18. This suggests ineffective enforcement of tobacco control laws in the country. This unstable pattern of fluctuation in the prevalence of tobacco smoking has been observed in the past and it warrants a long-lasting, well-designed programme to address this issue at the school level. The Country Report of GYTS 2015 advocates the further reduction of the prevalence of tobacco smoking using the tobacco control strategies mentioned in Framework Conventions of Tobacco Control (FCTC) (5).

As per a multi-country study encompassing 61 nations, the median prevalence of current tobacco smoking among students aged 13 to 15 years was at 10.7%. The highest prevalence was reported in Timor-Leste (35.0%), followed by Bulgaria (27.4%) and Lithuania (26.4%). Of the South-East Asian countries, the highest was reported in Timor-Leste (35.0%) followed by Indonesia (19.4%) and Bhutan (16.6%) (3). Therefore, the current smoking prevalence in the Kandy district in Sri Lanka is comparatively lower compared to the prevalence of current smoking in the same age group observed in global studies including South Asian countries,

In adolescents, elevated prevalence rates of tobacco smoking were linked to inadequate knowledge and unfavourable attitudes (6). Also, poor knowledge and the lack of favourable attitudes have been shown to influence the initiation of smoking (12). In the current study, 49.2% (n=692) of students in the Kandy district had satisfactory knowledge status. Regarding the attitude status, 71.5% (n=997) showed favourable attitudes toward the prevention of smoking. In the GYTS7 survey, adolescents in Sri Lanka aged 13 to 15 reported a 41% level of satisfactory knowledge and attitudes regarding the prevention of tobacco smoking (7).

However, in the current study out of 84 ever smokers, 50% (n=42) showed poor knowledge status. Regarding the attitudes toward the prevention of tobacco smoking, the majority of the ever smokers showed unfavourable attitudes (77.4%, n=65). Considering the knowledge of harmful effects, the current study showed that 40% of students either do not know or disagree that smoking carries a risk of becoming addicted. Also, 27.2% are unaware of the well-established documented harmful effects of tobacco smoking. This shows that although the students were aware of the dangers of smoking, most were aware of common physical harms. In a study conducted in the Anuradhapura district in 2011, in 456 male subjects including 37% adolescents and 63% young adults, similar observations were reported. Their knowledge of direct physical harms like lung cancer and pregnancy-related complications was high (13). In GYTS conducted in 2015, most students (78.9%) reported that the dangers of smoking were taught in class but, they had an average or poor response on questions not on physical harm (E.g. Media influence on tobacco use, legal background) (5).

Considering the attitudes, the current study showed that students had favourable attitudes towards censoring pro-tobacco scenes in visual media (66.2%, n=924). However, nearly 25% of them had not decided whether censoring causes a reduction in experimenting smoking among students. In GYTS 2015, 83.1% (95% CI= 77.6-87.5) reported having observed pro-tobacco scenes in visual media (5). However, the number of students who reported on media influence in the whole survey was less than 35 according to the report. Since most notice the pro-tobacco scenes in visual media in current study and past studies, the question can be raised of whether students learn to refrain from smoking or whether these scenes serve as promotions. Perera and Gunawardena14 reported in their cross-sectional study conducted among 498 schooling adolescents in Sri Lanka that 51.6% (n=257) were aware of social media being used as a promotion strategy by the tobacco trade (14). Also, 53% (n=264) were aware of the use of electronic media to glamorize the habit of smoking. In the same study, they showed that 50% (n=249) of adolescents knew famous individuals were being paid by the tobacco industry to smoke in public (14). Therefore, it is important to develop appropriate anti-tobacco media strategies to reach this population, to direct them to learn from what they watch or hear in the media.

In the current study, 72.8% (n=1015) of students agreed that having pictorial messages that depict harmful messages on cigarette smoking discourages smoking. Also, 66.2% (n=924) agreed that censoring pro-tobacco scenes in visual media reduces school children's experimenting with tobacco smoking. Perera and Gunawardena14 in their study reported that students were aware of laws to control tobacco promotional activities such as the prohibition of tobacco advertisements (52.4%, n=261). However, in that study awareness of laws regarding sponsorships by the tobacco trade (15.8%, n=78), and offenses related to trademarks of tobacco products (18.3%, n=91) were unsatisfactory. The findings of the current study may differ from the findings of Perera and Gunawardena14 may be due to more regional variances and students may have gathered more knowledge with time being the current study was conducted three years later. Also, the above study was conducted among 498 adolescents in the same age group selected randomly from seven schools in Polonnaruwa district using convenient sampling. More than 90% of students in the current study believed that smoking should be banned if it is religiously unaccepted. Similar observations were reported in studies conducted in regions where cultural and religious barriers to smoking play a role in prevention. Sahib & Al-Badri15 conducted a cross-sectional study in Iraq among 2915 students of the age group of 10-13 years reported a high percentage (51.4%) of students who believed that smoking is inconvenient with religion (15). This emphasizes the importance of adding cultural norms and considering cultural context in prevention programmes. In the current study, the majority of the students did not believe that smoking is a way of expressing their independence (76.7%, n=1069), or that smoking causes attraction towards others (70.6%, n=985). These observations reflect that the majority disregards smoking as a method of self-attraction and self-confidence. This was further strengthened by them by the majority (71.4%) disagree with the fact that quitting tobacco smoking is not easy. These observations provide a good base for a properly planned school-based smoking prevention programme to be implemented at the school level. However, we have identified certain limitations in our study. Self-reporting of tobacco smoking may provide underestimates due to social desirability bias. Since smoking is stigmatized in Sri Lankan communities this fact may apply to this study as well. However, self-administered questionnaires may have reduced the bias. Since the age group is 13 to 15 years, adding to social stigma, fear of exposing facts in the customary school-based education system may have further lead to underestimates. However, to minimize these we have ensured the confidentiality of the data collected and reassured the subjects with information sheets. Also, we have used indirect questions on tobacco smoking status and most of the questions were standard questions used in global surveys.

These findings indicate that, despite the availability of abundant information on tobacco control, a knowledge and attitude gap persist regarding tobacco smoking among the school-aged population in the 13 to 15-year age group.

Author declaration

Acknowledgements:
We acknowledge with gratitude the Department of Education, Central Province, all zonal Education directors of Kandy district, and all the principals and staff of schools for their support in conducting this research.

Authors' contributions:
Study concept and design: H.W.S.R.R. and D.S.D.; Acquisition of data, analysis, and interpretation of data: H.W.S.R.R. and D.S.D.; Drafting of the manuscript: H.W.S.R.R.; Study supervision: D.S.D.

Conflicts of interest:
The authors declare that there is no financial or non-financial conflict of interest.

Funding statement:
Self-funded

Ethics statement:
Ethical clearance was obtained from the Ethical Review Committee of the Faculty of Medicine, University of Peradeniya. Informed consent was obtained from each participant with an ascent from the parents of each participant.

Statement on data availability:
The datasets generated and/or analyzed during the current study are available from the corresponding author on reasonable request.

REFERENCES

1. World Health Organization & Ciapponi, Agustín. Systematic review of the link between tobacco and poverty. World Health Organization. 2014 https://apps.who.int/iris/handle/10665/136001
2. Rew L, Wong YJ. A systematic review of associations among religiosity/spirituality and adolescent health attitudes and behaviors. Journal of adolescent health. 2006 Apr 1;38(4):433-42. https://doi.org/10.1016/j.jadohealth.2005.02.004
3. Arrazola RA, Ahluwalia IB, Pun E, de Quevedo IG, Babb S, Armour BS. Current tobacco smoking and desire to quit smoking among students aged 13–15 years—global youth tobacco survey, 61 countries, 2012–2015. Morbidity and Mortality Weekly Report. 2017 May 5;66(20):533. doi: 10.15585/mmwr.mm6620a3
4. Everett SA, Warren CW, Sharp D, Kann L, Husten CG, Crossett LS. Initiation of cigarette smoking and subsequent smoking behavior among US high school students. Preventive medicine. 1999 Nov 1;29(5):327-33.https://doi.org/10.1006/pmed.1999.0560
5. World Health Organization. WHO Country Report on the Global Youth Tobacco Survey, 2015 Country Profile: Sri Lanka., Geneva: WHO press. http://apps.who.int/iris/handle/10665/250251 gyts_sri_lanka_2015_report.pdf
6. Obaid HA, Hassan MA, Mahdy NH, El Disouky MI, Alzarba FE, Alnayeemi SR, Rillera MC, Al Mazrooei BS. Tobacco use and associated factors among school students in Dubai, 2010: intervention study. EMHJ-Eastern Mediterranean Health Journal. 2014;20(12):765-73. https://apps.who.int/iris/handle/10665/255325
7. World Health Organization. WHO Country Report fact sheet on the Global Youth Tobacco Survey, 2011 Country Profile: Sri Lanka., Geneva: WHO press. http://www.searo.who.int/entity/noncommunicable_diseases/data/srl_gyts_fs_2011.pdf?ua=1
8. Ministry of Education. School Census preliminary report 2016 http://www.moe.gov.lk/english/images/Statistics/stat2015-16/2016_new3.pdf
9. Lwanga SK, Lemeshow S, World Health Organization. Sample size determination in health studies: a practical manual. World Health Organization; 1991. https://apps.who.int/iris/handle/10665/40062
10. Cutting WA. Medicine in the tropics: Practical epidemiology: DJP Barker and AJ Hall. Edinburgh: Churchill Livingstone, 1991. 176 pp. Price£ 7.95. ISBN 0-443-03787-6.
11. Senanayake S, Gunawardena S, Kumbukage M, Wickramasnghe C, Gunawardena N, Lokubalasooriya A, Peiris R. Smoking, alcohol consumption, and illegal substance abuse among adolescents in Sri Lanka: results from Sri Lankan global school-based health survey 2016. Advances in Public Health. 2018 Nov 25;2018:1-7. https://doi.org/10.1155/2018/9724176
12. Karimy M, Niknami S, Heidarnia AR, Hajizadeh I, Montazeri A. Prevalence and determinants of male adolescents' smoking in Iran: An explanation based on the theory of planned behavior. Iranian Red Crescent Medical Journal. 2013 Mar;15(3):187. doi: 10.5812/ircmj.3378
13. De Silva WD. Effectiveness of tobacco control measures in reducing tobacco use among adolescents and young adults in Anuradhapura, Sri Lanka. Asia Pacific Journal of Medical Toxicology. 2012 Dec 1;1(1):22-6.
14. Perera EM, Gunawardena NS. Tobacco-promotional activities in rural Sri Lanka: a cross-sectional study of knowledge, exposure, and responses among adolescent schoolchildren. WHO South-East Asia Journal of Public Health. 2015;4(2):159-66. https://apps.who.int/iris/handle/10665/329700
15. Sahib AJ, Abd Al-Badri HJ. Assessment of the knowledge and attitudes of preliminary school students toward smoking in Baghdad. Epidemiology, Biostatistics, and Public Health. 2016 Mar 21;13(1). DOI: 10.2427/11612