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Comparison of common predictors of current cigarette smoking among adolescents: Across South East Asian countries

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ABSTRACT

Background: The Southeast Asian countries have about 600 million tobacco smokers within the global Burden of tobacco users. Nearly half of the male population and two in every five females in the South-East Asia Region (SEAR) consume tobacco. 19% (Bangladesh) to 55% (Timor-Leste) of 13–17-year old students tried their first cigarette before their 14th birthday.

Aim: To assess common exposure variables of current cigarette smoking in SEAR countries among school-going adolescents and compare the prevalence and common predictors within SEAR region.

Data: Global Youth Tobacco Survey (GYTS) data is used.

Result: A total of 37903 school-going adolescents were included in this study from 10 SEAR countries. The overall prevalence of current cigarette smoking was found 13.1% in SEAR. The minimum prevalence is 1.5% in Sri Lanka (2015), and the maximum is 28.9% in Timor-Leste (2013). Adolescents whose close friends offered to smoke were 21.89 times more likely (AOR = 21.89; 95% CI: 19.60–24.49; $P < 0.001$) to commit smoking than who didn't offer to smoke.

Conclusions: Cigarette smoking anywhere in the presence of adolescents and their close friend can act as a promoter for adolescents to smoke. So, to reduce current cigarette smoking, efforts should be made to enforce an anti-smoking policy strictly. Media messages should be spreading aggressively to make people aware of current and second-hand smoking. The public health community may also be used to implement the anti-smoking rule in collaboration with NGOs, academia, research institutions, and regional partners.

1. Introduction

Globally almost one-third of the adult population (933 million) smoke daily.[1,2] Smoking causes non-communicable diseases (NCDs), mainly cardiovascular diseases (CVD), cancers, and lung diseases, making it a significant public health threat.[1,3] There are 1.2 billion smokers globally, of which more than 50% are young people.[4,5] The southeast Asian countries have about 600 million tobacco smokers within the global Burdon of tobacco users.[6] Adolescents aged 10–19 years are the majority of the population in South East Asian countries, and they are particularly vulnerable to tobacco use.[7] Nearly half of the male population and two in every five females in the South-East Asia Region (SEAR) consume some form of tobacco.[8] Cigarette smoking is the most common form of tobacco use in most countries. Most adult smokers initiate smoking before age 18.[9] As per the global estimates, nearly 9 out of 10 smokers start before 18 years of age, and 98% start smoking by 26 years. Almost 3 out of 4 adolescent smokers become adult smokers.[8,10] Southeast Asia is a high-risk region and experiences 1.2 million tobacco-attributable deaths per annum.[11]

The finding of cigarette smoking in SEAR countries is of immense concern for countries like Thailand, Bhutan, Indonesia, and Timor-Leste, where cigarette smoking is highly prevalent among adolescents.[12–14] There is 350 million adolescent population in the South-East Asia Region (SEAR), about 22% of the total population of the South-East Asia Region (SEAR). The largest segment of the adolescent population encompasses school-going children, who are most susceptible to experimentation with smoking.[15] The emerging smoking epidemic, along with its social, economic, and health consequences, needs to be controlled to achieve tobacco elimination among school-going teenagers.[16]

Southeast Asia Region is the most populous globally. It has many different socio-demographic factors, parental behaviour, social behaviour, activities, etc. However, Multiple studies were available in the public domain which compared the burden of smoking in terms of disease and prevalence of smoking. They also evaluated the association of

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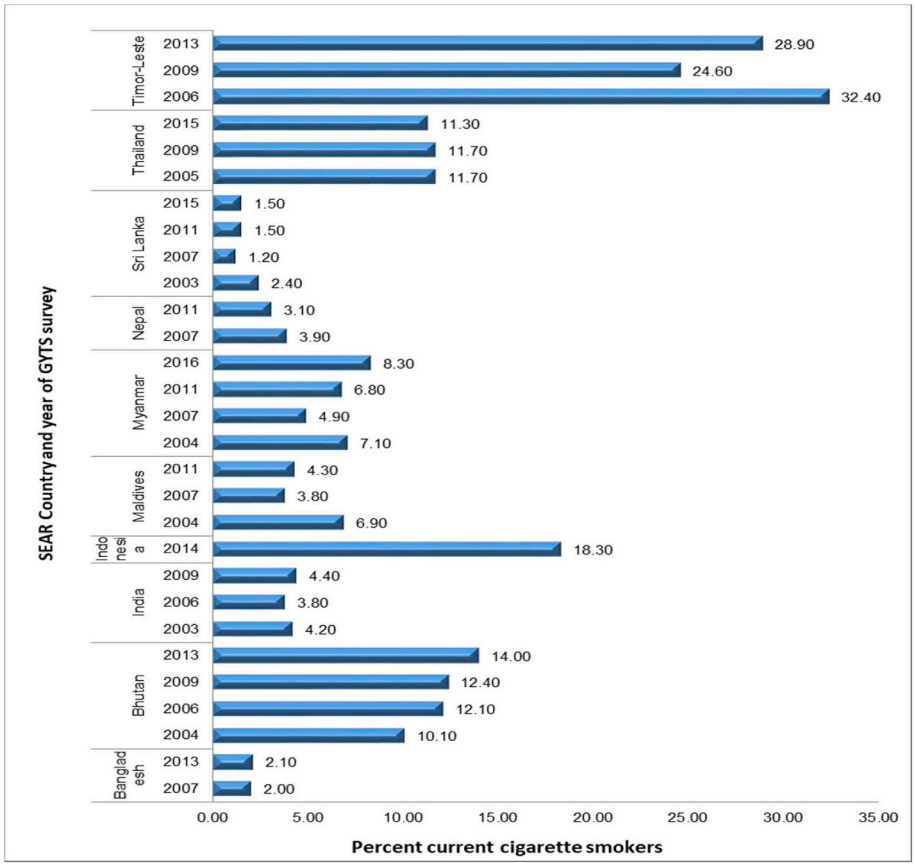

Fig. 1. Comparison of prevalence of current cigarette smokers within and between WHO-SEAR countries.

some demographic factors with current cigarette smoking. Unfortunately, none of the research articles found that compare how countries wise these common factors of socio-demographic, parental, social behaviour, and social activities impacted as predictor variables in the South East Asian Region. This study aimed to determine the common predictors of current cigarette smoking and compare these predictors countries wise among all SEAR. The countries-wise association of these common predictors with the current cigarette smoking in school-going students studying in grade eight to ten (aged 11–17 years old) is also analysed. Countries' prevalence of current cigarette smoking and its pattern is also be investigated.

2. Materials and methods

This study involved a nationally representative cross-sectional secondary data of the Global Youth Tobacco Survey (GYTS) of the World Health Organization (WHO) – Southeast Asia Region (SEAR). The southeast Asian Region (SEAR) comprises countries Bangladesh, Bhutan, India, Indonesia, Maldives, Myanmar, Nepal, Sri Lanka, Thailand, and Timor-Leste as per World Health Organization. In these ten countries, GYTS was implemented and collected data at regular intervals between 2003 and 2016. The Global Youth Tobacco Survey is a school-based survey designed to enhance the capacity of countries to monitor tobacco use among youth and guide the implementation and evaluation of tobacco prevention and control programs. Data available in the public domain on WHO and CDC websites is used.[18]

A two-stage cluster sample design was used to produce representative data. In the first stage schools were selected with probability proportional to enrolment size. In the second stage, classes were randomly selected, and all students in selected classes were eligible to participate. Since the data was collected from school, the student age class interval was between 11 and 17 years. It includes data on the prevalence of cigarette and other tobacco use, perceptions and attitudes about tobacco, access, availability of tobacco products, exposure to second-hand smoke, school curricula, media, advertising, and smoking cessation.

3. Statistical analysis

The study variable is current cigarette smoking, i.e., the adolescent who smokes within the past 30 days preceding the survey. Independent variables were taken as age, parental smoking habits, people smoking at home, people smoking in the presence of adolescents, accepting a cigarette offered by one of the best friends. Further, study variables were categorized in binary responses as current cigarette smokers (coded as 1) and non-smokers (coded as 0).

The association between the exposure and study variables was explored using bivariate statistics, univariable and multivariable logistic regression analysis. The odds ratio (OR) along with adjusted odds ratio (AOR) with their 95% confidence intervals were presented by adjusting other variables such as education, gender, boys and girls felt adolescents who smoke have more friends, perception about harmful, attractiveness, gain/lose weight. The software used here for statistical analysis is SPSS-23 licence version and R- 4.2.0.

4. Result

A total of 37903 individual adolescents were included in this study which comprises the data of Bangladesh (3245), Bhutan (2319), India (11,768), Indonesia (5986), Maldives (2641), Myanmar (3633), Nepal (2878), Sri Lanka (1505), Thailand (1876), Timor-Leste (2052)). Of these total individuals, 4977 (approx.13%) were current cigarette smokers and 32926 (87%) non-smokers. Fig. 1 shows the prevalence of current cigarette smokers among the South East Asian Region (SEAR) countries. Variation of the majority of current cigarette smoking may be

Table 1
Yearwise number(%) of current smoker adoloscent among WHO-SEAR country account to some common characteristics.

Characteristics of adolescents		WHO-SEA Countries									
		Bangladesh	Bhutan	India	Indonesia	Maldives	Myanmar	Nepal	Sri Lanka	Thailand	Timor-Leste
		Number of current cigarette smokers (Percent)									
Year of Survey/data		2013	2013	2009	2014	2011	2016	2011	2015	2015	2013
Age Group	**< 15 years**	142 (5.2)	141 (12.6)	601 (7.6)	869 (16.5)	175 (13.4)	161 (10.2)	109 (8.1)	18 (1.8)	156 (10.7)	614 (54.9)
	>=15 years	26 (5.0)	329 (27.5)	287 (7.5)	250 (34.2)	155 (11.6)	369 (18.0)	199 (13.0)	23 (4.5)	87 (21.1)	432 (46.3)
Gender	**Male**	127 (9.0)	312 (30.7)	482 (8.5)	998 (35.6)	79 (6.3)	459 (27.1)	184 (13.4)	33 (4.3)	173 (20.1)	805 (71.6)
	Female	41 (2.2)	156 (12.1)	370 (6.3)	119 (3.7)	193 (15.6)	67 (3.5)	100 (7.2)	8 (1.1)	69 (6.8)	237 (25.6)
Parental smoking habits	**No/Don't know**	NA	NA	489 (5.6)	78 (51.0)	161 (10.9)	253 (11.6)	126 (8.4)	32 (2.5)	145 (13.8)	398 (42.6)
	Both			83 (13.9)	1027 (17.7)	43 (24.6)	40 (19.9)	75 (16.0)	0 (0.0)	8 (20.5)	139 (61.0)
	Father only			258 (11.5)	11 (55.0)	88 (10.3)	215 (18.7)	74 (10.1)	8 (3.6)	85 (11.2)	459 (57.2)
	Mother only			49 (22.5)	3 (100.0)	12 (14.0)	15 (15.6)	30 (19.2)	0 (0.0)	3 (14.3)	28 (59.6)
People smoke at home in the presence	**No**	56 (2.6)	306 (15.8)	327 (3.7)	258 (17.9)	139 (8.3)	222 (9.3)	126 (7.2)	25 (1.9)	119 (9.7)	247 (35.8)
	Yes	112 (10.1)	164 (42.7)	561 (19.9)	861 (19.0)	191 (19.6)	308 (24.8)	182 (16.0)	16 (8.0)	124 (19.0)	799 (58.7)
People smoke inside public place in presence	**No**	37 (2.9)	185 (13.7)	278 (3.7)	261 (10.2)	90 (6.6)	262 (10.3)	97 (6.5)	17 (1.8)	114 (10.0)	214 (35.1)
	Yes	131 (6.6)	285 (29.4)	610 (14.2)	858 (25.1)	240 (18.9)	268 (24.6)	211 (15.1)	24 (4.4)	129 (17.6)	832 (57.7)
People smoke outside public place in presence	**No**	55 (4.1)	167 (13.3)	NA	229 (9.6)	94 (9.9)	233 (9.4)	83 (6.8)	16 (1.6)	112 (9.6)	203 (34.3)
	Yes	113 (5.9)	303 (28.5)		890 (24.7)	236 (14.0)	297 (25.7)	225 (13.6)	25 (4.8)	131 (18.4)	843 (57.7)
Smoke when offered best friends	**Def/Prob. No**	127 (4.1)	323 (15.3)	508 (4.7)	274 (5.6)	164 (7.0)	306 (9.2)	223 (8.2)	26 (1.8)	109 (6.5)	518 (36.2)
	Def/Prob. Yes	39 (30.0)	144 (69.9)	346 (47.9)	845 (78.3)	158 (53.6)	222 (73.3)	79 (58.5)	15 (44.1)	127 (67.6)	509 (86.4)
Smoke from other people is harmful	**Def/Prob. No**	18 (6.6)	73 (30.9)	279 (11.2)	704 (18.4)	96 (22.4)	45 (26.2)	85 (15.9)	7 (7.5)	38 (22.5)	219 (50.5)
	Def/Prob. Yes	143 (4.8)	391 (18.9)	580 (6.4)	415 (19.3)	212 (9.8)	480 (13.9)	211 (9.1)	33 (2.4)	201 (11.8)	814 (51.1)
Media message on television, papers, movies, etc.	**Yes**	124 (5.4)	346 (20.4)	676 (7.3)	716 (20.9)	266 (12.0)	526 (14.5)	259 (10.4)	41 (2.7)	229 (12.3)	1020 (50.8)
	No	33 (3.5)	109 (18.3)	185 (7.9)	402 (15.8)	56 (14.7)	0 (0.0)	38 (10.3)	0 (0.0)	0 (0.0)	0 (0.0)

NA: Data not available.

seen in Fig. 1, within and between countries over the various GYTS data collection year between 2003 and 2016.

Prevalence of current cigarette smoking in Timor-Leste was found 32.4% in 2006, 24.6% in 2009 and 28.9% in 2013, which shows inconsistent prevalence within a country, but when comparing this prevalence with other SEAR Countries, Timor-Leste shows having higher prevalence than other countries, among all the GYTS, surveyed year data. Indonesia has only data from 2014 that shows the second-highest prevalence (18.3%) among SEAR countries. Bhutan found the third-highest prevalence of current cigarette smoking among SEAR countries (10.1% in 2004, 12.1% in 2006, 12.4% in 2009, and 14.0% in 2013). This prevalence's showing an increasing trend over the surveyed years in Bhutan. Thailand has the fourth-highest current cigarette smoking country among SEAR countries. The country itself shows a consistent trend over various GYTS years (11.7% in 2005 and 2009 and 11.3% in 2015). Prevalence of current cigarette smoking in Myanmar found 7.1% in 2004, 4.9% in 2007, 6.8% in 2011, and 8.3% in 2016, which were the fifth-highest although the inconsistent prevalence of current cigarette within countries. Among all WHO-SEAR countries, the lowest prevalence was found in Sri Lanka, 2.4% in 2003, 1.2% in 2007, 1.5% in 2011 and 2015, and showed a decreasing trend over the various GYTS year. Prevalence of current cigarette smoking in Bangladesh were 2.0% in 2007 and 2.1% in 2013 and in Nepal, 3.9% in 2007 and 3.1% in 2011, similarly in India, 4.2% in 2003, 3.8% in 2006 and 4.4% in 2009.

Table 1 represents the comparisons of current cigarette smokers' adolescents according to their common characteristics/factors such as demographic, social, parental, etc. However, the survey years of GYTS data in these countries are different. Prevalence of current cigarette smoking among adolescents age <15 years having higher in Timor-Leste (54.9%), followed by Maldives (13.4%), India (7.6%), and Bangladesh (5.2%) as compared to adolescents age≥15 years. At the same time, other countries have a higher prevalence in age≥15 years, such as Indonesia (34.2%), followed by Bhutan (27.5%), Thailand (21.1%), Myanmar (18.0%), Nepal (13.0%), and Sri Lanka (4.5%) as compared to adolescent age <15 years. When comparing male versus female adolescents, except for the Maldives, all other countries have a higher prevalence of males than females. Information related to parental smoking, such as mother and father, both are smokers or father only smokers or mother only smokers or don't know about their smoking habits, collected from adolescents in each SEAR country except Bangladesh and Bhutan.

Regarding parental smoking habits, where both mother and father are smokers, adolescents' current cigarette smoking prevalence was found higher in Timor-Leste (61.0%) followed by Maldives (24.6%),

Table 2
Association of some common Socio-demographic characteristics with current cigarette smokers in different WHO- SEAR countries.

Characteristics of adolescents		WHO-SEA Countries, Number of adolescents reported having smoking past 30 days of survey date (%)									
		Bangladesh	Bhutan	India	Indonesia	Maldives	Myanmar	Nepal	Sri Lanka	Thailand	Timor-Leste
		Adjusted Odds Ratio (AOR) and [Lower Limit –Upper Limit] at 95% confidence interval									
Age Group (Ref: < 15 years)	**>=15 years**	1.13[a] [0.71–1.78]	2.14 [1.67–2.75]	0.88[a] [0.74–1.05]	2.30 [1.77–3.00]	0.76 [0.56–1.05]	1.54 [1.21–1.96]	1.58 [1.18–2.11]	1.75[a] [0.84–3.61]	1.50 [1.03–2.20]	0.67 [0.53–.084]
Gender (Ref: Male)	**Female**	0.29 [0.19–0.42]	0.34 [0.26–0.43]	0.92[a] [0.78–1.08]	0.17 [0.13–0.21]	2.22 [1.59–3.10]	0.15 [0.11–0.20]	0.58 [0.44–0.77]	0.32 [0.13–0.82]	0.34 [0.24–0.50]	0.15 [0.12–.019]
Parental smoking habits (Ref: No/Don't know)	**Both**	NA	NA	0.97[a] [0.73–1.30]	0.31 [0.19–0.52]	2.24 [1.33–3.75]	1.28[a] [0.80–2.05]	1.59 [1.09–2.33]	[a]	0.74[a] [.21–2.63]	1.69 [1.17–2.42]
	Father only			0.71 [0.57–0.88]	2.36[a] [0.65–8.54]	0.60 [0.41–0.88]	1.24[a] [0.96–1.59]	0.89[a] [0.62–1.27]	0.50[a] [0.17–1.46]	0.63 [0.43–0.93]	0.79[a] [0.62–1.02]
	Mother only			0.80[a] [0.52–1.23]	–[a]	0.78[a] [0.31–1.94]	1.04[a] [0.52–2.10]	1.99 [1.19–3.33]	[a]	0.96[a] [0.21–4.38]	1.36[a] [0.62–3.01]
People smoke at home in presence (Ref: No)	**Yes**	3.19 [2.17–4.70]	2.62 [1.95–3.52]	3.31 [2.74–3.99]	0.99[a] [0.79–1.26]	2.01 [1.41–2.86]	1.68 [1.30–2.16]	1.47 [1.06–2.04]	2.81 [1.17–6.74]	1.55 [1.04–2.31]	1.69 [1.23–2.32]
People smoke inside public place in presence (Ref: No)	**Yes**	1.99 [1.21–3.26]	1.37 [1.02–1.84]	2.28 [1.86–2.76]	1.88 [1.46–2.44]	2.24 [1.54–3.26]	1.21[a] [0.91–1.68]	1.89 [1.31–2.73]	0.96[a] [0.37–2.47]	1.51[a] [0.95–2.39]	1.12[a] [0.77–1.63]
People smoke outside public place in presence (Ref: No)	**Yes**	0.53 [0.34–0.81]	1.59 [1.19–2.12]	NA	1.67 [1.28–2.17]	0.75[a] [0.50–1.13]	1.73 [1.28–2.34]	1.02[a] [0.70–1.50]	3.39 [1.33–8.68]	1.50[a] [0.95–2.36]	1.44 [1.02–2.03]
Smoke when offered best friends (Ref: Def/Prob. No)	**Def/Prob. Yes**	5.05 [3.12–8.17]	8.71 [6.06–12.52]	11.33 [9.28–13.84]	32.77 [26.74–40.17]	17.18 [12.18–24.23]	12.25 [9.06–16.57]	12.24 [8.03–18.64]	37.85 [15.01–95.46]	25.70 [17.41–37.95]	7.93 [5.90–10.65]
Smoke from other people is harmful (Ref: Def/Prob. No)	**Def/Prob. Yes**	1.02[a] [0.56–1.84]	0.62 [0.43–0.90]	0.48 [0.40–0.58]	1.13[a] [0.92–1.38]	0.43 [0.30–0.62]	0.62 [0.40–0.96]	0.47 [0.34–0.67]	0.15 [0.06–0.41]	0.45 [0.27–0.76]	0.66 [0.50–0.87]
Media message on television, papers, movies, etc. (Ref: No)	**Yes**	1.42[a] [0.94–2.16]	1.08[a] [0.81–1.43]	1.23[a] [0.99–1.53]	1.10[a] [0.89–1.35]	1.62 [1.02–2.57]	0.14 [—]	1.13[a] [0.72–1.76]	0.05 [—]	0.14 [—]	1.21 [—]

[a] Statistically not significant.

Thailand (20.5%), and Myanmar (19.9%). In contrast, where only mothers are smokers, Indonesia (100.0%) followed by Timor-Leste (59.6%), India (22.5%), and Nepal (19.2%) are high prevalent countries. Prevalence of current cigarette smoking, where people either smoke in the home or smoke inside or outside of the in the presence of the adolescent, found 1.8%–23.4% higher than those who smoke cigarettes in the absence of adolescents. India does not have collected information on people smoking in the presence of adolescents. Adolescents were asked if their best friend offered them a cigarette to smoke and whether they would accept it or not. Higher prevalence of current cigarette smoking in those adolescents who responded/probably yes compared to those who said definitely/probably no in all SEAR countries. Adolescents were further asked, "Do you think the smoke from other people's cigarettes is harmful to you." For analysis, the responses were categorized into two categories, i.e., "definitely/probably yes" and "definitely/probably no." Only Timor-Leste and Indonesian adolescent was reported higher prevalence indefinitely/probably yes than definitely/probably no. Prevalence of current cigarette smoking was also higher in those adolescents who reported seeing more anti-smoking media massages, except in India and Maldives.

The multivariate logistic regression analysis for each SEAR country is presented in Table 2, which shows the association of current cigarette smoking with independent factors considered in this study. The Chi-square test was also used to check the statistically significant association. Only statistically significant variables were considered in multivariable analysis. Current cigarette smokers in the age group 15 years and above were found more likely to smoke in Indonesia (AOR = 2.30, 95%CI:1.77–3.00) followed by Bhutan (AOR = 2.14, 95%CI: 1.67–2.75), Sri Lanka (AOR = 1.75, 95%CI: 0.84–3.61), Nepal (AOR = 1.88, 95% CI:1.18–2.11), Myanmar (AOR = 1.54, 95%CI = 1.21–1.96), Thailand (AOR = 1.50, 95%CI = 1.03–2.20) and Bangladesh (AOR = 1.13, 95% CI: 0.71–1.78). In comparison, Maldives (24.0%) and India (12.0%) were less likely to smoke than the age group under 15 years. Except for Maldives (AOR = 2.22, 95%CI: 1.59–3.10), in all other SEAR countries, female adolescents were less likely to smoke cigarettes than male adolescents. Adolescents whose father and mother both are smoking, found statistically significant and more likely to smoke cigarettes in Maldives (AOR = 2.24, 95%CI: 1.33–3.75) followed by Timor-Leste (AOR = 1.69, 95%CI: 1.17.2.42) and Nepal (AOR = 1.59, 95%CI: 1.09–2.33), while whose only mother smoking, Nepal (AOR = 1.99, 95%CI: 1.19–3.33) is found statistically significant and more likely to smoke cigarettes, all other countries were not found statistically significant for parental smoking in compared to those adolescents, who responded their parents were non-smoker or they don't know about their smoking habit. The maximum adjusted odds ratio for people smoking at home is 3.31 times more odds (AOR = 3.31; 95%CI: 2.74–3.99; $p < 0.001$). People smoking inside the public place is 2.28 times more odds (AOR = 2.28; 95%CI: 1.86–2.76; $p < 0.001$) found in India, while the maximum adjusted odds ratio for people smoking outside public places is Sri Lanka (AOR = 3.39; 95%CI: 1.33–8.68; $p < 0.001$) as compared to non-smoker at home or inside/outside public place in the presence of the adolescent. Similarly, the minimum adjusted odds ratio for people smoking at home in Indonesia, almost equivalent to no people smoking at home and for people smoking inside a public place, is Timor-Leste (AOR = 1.12, 95% CI: 0.77–1.63), which is 12% more likely to smoke. Smoking in a public places in Bangladesh, which is 47% less likely to smoke than no people smoking at present of adolescents. Regarding acceptance of cigarettes to smoke, respondents (boys/girls) reported that they definitely/Probably accept cigarettes offered by one of their best friends. These respondents were more than 37.85 times (AOR = 37.85; 95%CI: 15.01–95.46; $p < 0.001$) more likely to smoke in Sri Lanka as compared with the adolescents who had none of their closest friends offered cigarettes to smoke and minimum AOR for Bangladesh (AOR = 5.05, 95%CI: 3.12–8.17, $p < 0.001$). Cigarette smoking from other peoples is harmful to your health, with maximum odds reported by Bangladesh (AOR = 1.02; 95%CI: 0.56–1.84; $p < 0.001$) and minimum AOR by Sri Lanka. As compared to those who do not see anti-smoking media massages, more likely odd found in those who saw media massages, maximum in the Maldives (AOR = 1.62, 95%CI: 1.02–2.57, $p < 0.001$) followed by Bangladesh, India, Timor-Leste, Nepal, Indonesia, Bhutan while remaining countries were less likely to smoke a cigarette.

Table 3
Association of some common Socio-demographic characteristics with current cigarette smokers as a whole in WHO_SEAR region.

Characteristics of adolescents		Yes (%)	OR (univariable)
Age	<15 years	2847 (11.5)	–
	≥15 years	2130 (16.3)	1.51 (1.42–1.60, $p <$ 0.001)
Gender	Female	1253 (6.4)	–
	Male	3615 (20.1)	3.65 (3.41–3.91, $p <$ 0.001)
Parental smoking habits	Both	1415 (18.8)	–
	Father only	1236 (18.2)	0.96 (0.88–1.05, $p =$ 0.353)
	Mother only	156 (24.8)	1.42 (1.17–1.72, $p <$ 0.001)
	No/Don't know	1469 (8.5)	0.40 (0.37–0.44, $p <$ 0.001)
People smoke at home in presence	No	1747 (7.4)	–
	Yes	3230 (22.4)	3.59 (3.37–3.82, $p <$ 0.001)
People smoke inside public place in presence	No	1457 (7.0)	–
	Yes	3520 (20.5)	3.42 (3.21–3.65, $p <$ 0.001)
People smoke outside public place in presence	No	1568 (6.7)	–
	Yes	3409 (23.3)	4.19 (3.93–4.47, $p <$ 0.001)
Smoke when offered best friends	Def/Prob. No	2070 (9.0)	–
	Def/Prob. Yes	2138 (72.3)	26.43 (24.11–29.00, $p < 0.001$)
Smoke from other people is harmful	Def/Prob. No	1483 (17.1)	–
	Def/Prob. Yes	3413 (11.8)	0.65 (0.61–0.69, $p <$ 0.001)
Media message on television, papers, movies, etc.	No	863 (12.1)	–
	Yes	4008 (13.2)	1.11 (1.03–1.20, $p =$ 0.009)

Table 3 shows the descriptive and univariable association on combined data of 10 countries of SEAR of the above stated common characteristics/factors with current cigarette smokers' adolescents. Prevalence of current cigarette smoking in adolescents age≥15 years (16.3%) is higher (OR = 1.51, 95%CI: 1.42–1.60, $p < 0.001$) than adolescent age <15 year (11.5%). Male adolescents (20.1%) were 3.65 times more vulnerable to cigarette smoking than female adolescents (6.4%). Parental smoking information was also collected in each SEAR except in Bangladesh and Bhutan. Adolescents whose only mothers are smokers found more currently cigarette smoking (OR-1.42, 95%CI: 1.17–1.72, $p < 0.001$) than those adolescents whose either father only or both (father and mother) are smokers. People who smoke either in-home or inside or outside of any public place in the presence of the adolescents, found 3.59 times, 3.42 times, and 4.19 times more likely to be current cigarette smokers than those who do not smoke, respectively. Higher prevalence of current cigarette smoking in those adolescents who responded/probably yes (72.3%) compared to those who said definitely/probably No (9%) in all SEAR countries. Adolescents were further asked, "Do you think the smoke from other people's cigarettes is harmful to you." For analysis, the responses were categorized into two categories, i.e., "definitely/probably yes" and "definitely/probably No." The higher prevalence reported indefinitely/probably No (17.1%) than/

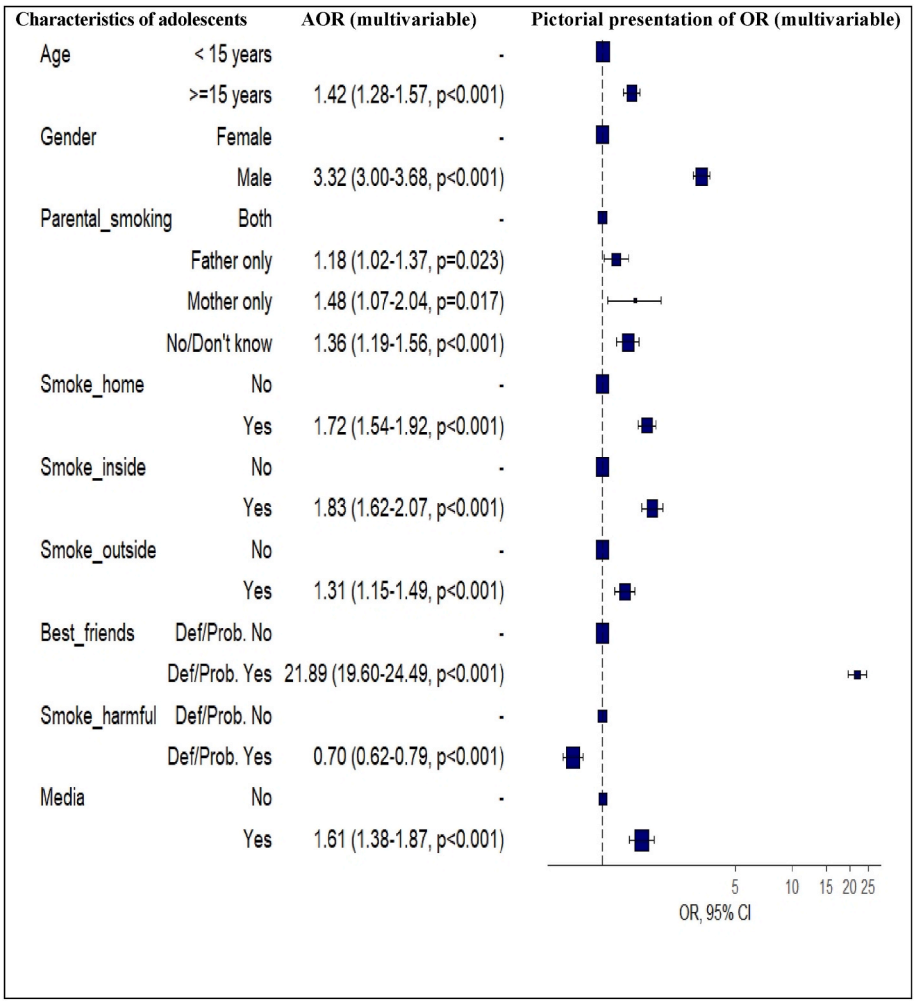

Fig. 2. Adjusted odds ration of common socio-demoggraphi characteristics in WHO-SEAR region.

probably Yes (11.8%). 11% of adolescents are more likely to cigarette terete who reported seeing more anti-smoking media messages than no media message on television, papers, etc.

Multivariable logistic regression analysis for all SEAR countries is presented in Fig. 2, which shows the association of current cigarette smoking with independent factors considered in this study. Current cigarette smokers in the age group 15 years and above were found 42% (ARO = 1.42, 95%CI:1.28–1.57, P < 0.001) more likely to smoke than the age group less than 15 years. Male adolescents were 3.32 times more likely to smoke cigarettes than female adolescents. People smoking in-home or inside/outside public places in the presence of the adolescent found positively associated with current cigarette smoking. The adjusted odds ratio for people smoking at home is 1.72 times more odds (AOR = 1.72; 95%CI: 1.54–1.92; p < 0.001), and for people smoking inside the public place is 1.83 times more odds (AOR = 1.83; 95%CI: 1.62–2.07; p < 0.001). People smoking outside the general area are 1.31 times more odds (AOR = 1.31; 95%CI: 1.15–1.49); p < 0.001) found in SEAR compared to non-smoker at home or inside/outside public places in the presence of the adolescent. Regarding acceptance of cigarettes to smoke, offered by one of the best friends, respondents (boys/girls) reported that they definitely/Probably accept cigarettes. These respondents were 21.89 times (AOR = 21.89; 95%CI: 19.60–24.49; p < 0.001) more likely to smoke than those adolescents who had none of their closest friends offered cigarettes smoke. Compared to those who do not see anti-smoking media messages, more likely odd were found in those who saw media messages (AOR = 1.61, 95%CI: 1.38–1.87, p < 0.001).

5. Discussion

The overall prevalence of current cigarette smoking among adolescents in this study ranges from 1.20% (Sri Lanka, 2003) to 28.9% (Timor-Leste, 2013). A Comparison of all old available data from recent available data shows that the prevalence of current cigarette smoking is on the increasing trend in Bangladesh, Bhutan, and Myanmar, while decreasing trends are reported in Nepal only and other remaining countries showing up downtrends among adolescents about current cigarette smoking. Smoking prevalence in the age group ≥15 years were found 2.30 times more likely in Indonesia (AOR = 2.30, 95% CI:1.77–3.00) and 24.0% less likely in Maldives (AOR = 0.76, 95%CI: 0.56–1.05) as compared to age group less than 15 years. Smoking prevalence was higher among male adolescents than female adolescents in all SEAR.[17–20]

The maximum effect of smoking at home and inside public areas found in India, which offers 3.31 and 2.28 times more odds of smoking in adolescents, respectively, while for outside smoking in public places, Myanmar showed 1.73 times more odds of smoking. Thus, smoking behaviour by people in the presence of adolescents at home or elsewhere may influence them to adopt the same habit, or it may significantly increase the likelihood of taking up smoking.[21,22]

Regarding acceptance of cigarette smoking, if offered by one of the closest friends, maximum odds found in Sri Lanka (37.85 times more odds) and minimum in Bangladesh (5.05 times more odds) among those adolescents who had their closest friends were smokers and offered a cigarette to their friends.[23–25]

Adolescents' thoughts on cigarette smoking from other people are harmful found a positive association for Indonesia (1.13 times odds) and Bangladesh (1.02 times odds), while the negative association of the detrimental effects of second-hand smoke for remaining SEAR. Students in the school reported have seen multi-media messages of anti-smoking durng the past 30 days, compared to students with no media messages for anti smoking found a positive association for all SEAR countries.[20,26–29]

6. Conclusions

Smoking is more common among male adolescents in all SEAR countries. In all the factors (considered for this study), adolescents of Timor-Leste, Indonesia, and Bhutan were found to have a high prevalence of current cigarette smoking compared to other South-East Asia Region countries. Anti-smoking media massage was also ineffective as 6.6%–50.5% of SEAR adolescents reported that passive smoking is not harmful to them. Parental or people smoking cigarettes at home or inside/outside public places in the presence of adolescents have more impact on adolescents smoking. To reduce the practice of cigarette smoking among older in South East Asia Region countries, efforts should be made to explore new measures to strengthen anti-smoking policy measures. Aggressive campaigns and media massage are required to make adolescents aware of the harmful effect of current and passive cigarette smoking. Efforts should also be made to use the public health community to implement the anti-smoking rule in collaboration with national and international agencies, NGOs, academic, research institutions, and regional partners. Based on the evidence, let's plan for active action to make smoke and tobacco-free environment.

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Declaration of competing interest

The authors do not have any conflicts of interest.

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