ORIGINAL ARTICLE

Smoke-free environment policy in Vietnam: what did people see and how did they react when they visited various public places?

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Summary

Introduction. *Since Vietnam has signed WHO framework on tobacco control (FCTC) in 2003 and has issued tobacco control law in 2013, there has been little research concerning about what impacts smoke-free regulations have had on public compliance. The objective of this study was to assess public exposure to secondhand smoke and reaction toward smoke-free policy regulations in Vietnam and the associated factor.*

Methods. *Using the design of GATS (Global Adult Tobacco Survey), a nationally representative sample of 8,996 adults were approached for data collection. Logistic regression was used to examine the associated factor.*

Results. *The study revealed that the prevalence of respondents exposed to secondhand smoke was much higher in bars/café/tea shops (90.07%) and restaurants (81.81%) than in any other public places,*

universities (36.70%), government buildings (31.12%), public transport (20.04%), healthcare facilities (17.85%) and schools (15.84%). 13.23% of respondents saw smokers violate smoke-free regulations. Among those who saw them violate smoke-free regulations, just one-third cautioned them to stop smoking. Strikingly, a higher rate of cautioning smokers to stop smoking was observed among the older, married, and better educated respondents. Respondents who were married, better educated and in lower economic status were more likely to remind smokers to stop smoking.

Conclusions. *The study has called for strengthening two of the six MPOWER (Monitor, Protect, Offer, Warn, Enforce and Raise) components of the tobacco free initiative introduced by WHO, Monitoring tobacco use and prevention policies and Protecting people from tobacco smoke.*

Introduction

Smoke-free policies are one of the most important initiatives to protect people from exposure to secondhand smoke, help smokers quit and reduce youth smoking [1]. Of the 195 members enrolling the WHO FCTC, 118 states (60%) have implemented the regulations of smoke-free environment policies from minimal to complete level [2]. In addition to raised tobacco taxation rates, smoke-free policies have been found as one of the most effective tobacco control measures [3-5]. Many studies have shared best practices in adopting smoke-free policies and proved health economic outcomes of these policies in the world despite the opposition and obstruction from public and tobacco industries [6]. The outstanding example is Turkey, the nation with the highest rate of adults smoking in Europe with 40.0% in 2006. After six years of policy release, it had achieved the rate of 13.4% by applying the MPOWER (*Monitor, Protect, Offering, Warn, Enforce, Raise*), especially the smoke-free environment

regulations [7]. The Article 8 of WHO FCTC and the letter "P" in MPOWER encourage states and nations to take action to protect their people from exposure to secondhand smoke in their work places, public transport and indoor public places.

Although many countries have been trying different approaches to applying the smoke-free regulations on national scale, only 18% of the world's population is protected with comprehensive and national laws which ban tobacco smoke in workplaces and public places, such as restaurants and pubs [2, 8, 9]. However, many smoke-free regulations are still implemented successfully at local level and multiplied in different places - outdoor areas and in shared housing settings [6, 8, 10, 11]. In any circumstances, not only is it non-smokers who take benefits from smoke-free regulations by being protected from exposure, but also smokers who want to quit. It has been found in several industrialized countries that smoke-free policies in work places reduced total tobacco consumption among workers by an average of 29% [1].

Vietnam is among the countries with the highest smoking rate and its government has early recognized the burden of tobacco use as well as the high need of tobacco control policies in which smoking bans indoor and outdoor locations are of top priorities [12]. Prior to the adoption of WHO FCTC, the Government of Vietnam had enacted the National Tobacco Control Policy 2000-2010 which prohibited smoking in theaters, offices, health facilities, schools and other public areas [13]. After having signed the WHO FCTC in 2003, the Prime Minister and the Government have shown a strong commitment to strictly ban smoking from indoor workplaces and public places through Directive 12/2007/CT-TTg on strengthening tobacco control activities and the Decision No. 1315/QĐ-TTg on the Ratification of the Plan for the Implementation of the Framework Convention on Tobacco Control [14, 15]. Since 2013, the National Assembly has ratified the Law on Prevention and Control of Tobacco Harms [16]. This is the official document with the highest legal validity on tobacco control in Vietnam. In article 11, public places where smoking are completely prohibited include health facilities; education facilities; child care facilities and entertainment area designated for children; areas with high risk of fire and explosion; workplaces; universities and colleges; academic institutes and public means of transport (automobiles; air planes; sky train/metro). Article 12 of the law indicates areas where indoor smoking is prohibited, but allowed for separate designated smoking areas, such as airports segregation areas (waiting areas before boarding the plane); bars, karaoke lounges, discos hotel and guesthouses; on the public means of vehicle that are ships and trains [16]. In 2013, the government of Vietnam also approved Decision No 229/QD-TTg on the National Strategy for Tobacco Control by 2020 [17]. Since the law has been approved, several related policies have been implemented including the establishment of smoke-free places, increase in the size of graphic health warning labels, restricting tobacco advertising, promotion and sponsorship, and establishment of tobacco control fund. However, little is known about how public are exposed to secondhand smoke and how institutions have followed these policy initiatives. The objective of this study was to assess public exposure to secondhand smoke and reaction toward smoke-free environment policy regulations in Vietnam and associated factors.

Methods

Design. This is a cross-sectional quantitative survey on a nationally representative sample using the design of GATS. The study protocol was well completed through the technical support from CDC and WHO, Vietnam Tobacco Control Fund - VINACOSH (formerly VINACOSH), Institution for Preventive Medicine and Public Health, Hanoi Medical University, and Social-Environmental Statistics Department, General Statistics Office of Vietnam, and WHO.

Sample and sampling. The survey was taken on a nationally representative sample of 8,996 adults, including all men and women age 15 years old or older, in conformity with the GATS design. This target population included all people whose country of residence is Vietnam. This included those individuals residing in Vietnam even though they may not be considered a citizen of Vietnam. The sampling did not comprise those who were visitors (e.g. tourists), institutionalized in hospitals, or residing in an assisted living facility/nursing home, on a military base, and others. To reach a complete sample, the General Statistics Office developed a master sample, which consisted of 15% of population-based 2009 Census. It was sampled with the stratified two-stage random systematic sampling method. The sample contained 25,500 enumeration areas (EAs) from 706/708 districts of Vietnam (2 island districts were excluded from the GSO master sample frame). The sample was eligible if it met 1) random selection which was used in each sampling stage so that every member of the target population had a non-zero chance of being selected into the sample, and 2) the probability of selection for every unit (household and person) selected at each stage of the design was known and retained on the final analytic files for the study.

Data collection was conducted during August to October, 2015 in all 63 provinces of Vietnam. The pre-test took place before the main survey. The pre-test showed that it was technically feasible for the main survey as it met the criteria of face validity and content validity. The main survey was then done by the General Statistics Office by using electronic data collection (tablet PC) involved by 20 data collection teams, consisting of a total of 100 interviewers. Each team consisted of one team leader and 4 interviewers to ensure close supervision and collection of high quality data. They were trained by lecturers/resource persons from GSO, WHO, CDC and Vinacosh. After 2 training courses, the Steering Committee built the survey schedule for each team in cooperation with the Professional Statistics Offices (PSOs). Team leaders carried lists of selected households for assigned EAs. All the selected households were contacted during the main survey, and no replacement were made if a selected household or individual was absent during data collection. There was a standard provision of at least three call backs. Each team interviewed about 500 households on average. The survey was rigorously supervised by checking interview procedure, observing methodological compliance and managing data before, during and after the survey.

Measures. Key variables measured how public were exposed with secondhand smoke. There were two kinds of questions. The first included 7 variables which derived from 7 yes/no questions asking respondents if they were exposed to and inhaled the smoke from anyone who smoked inside of any of the following sites: government buildings or government offices, healthcare facilities, restaurants, bars/cafés/tea shops, public transport, kindergartens/schools, and universities. The second kind of question asked if respondents saw anyone who was both smoking and violating smoke-free regulations during the past 30 days.

Dependent variable was respondents cautioning smokers to stop smoking when seeing them violate smoke-free environment policy regulations, which was measured with one "yes/no/refused" question "Did you remind these smokers to stop smoking when you saw they were violating smoke-free regulations during the past 30 days?" All cases with refused response were excluded from data analysis.

Predictor variables were selected from the available GATS Vietnam 2015 data. They were *Gender* (male or female), *Age* (15-24, 25-44, 45-64 or ≥ 65 years old), *Marital status* (single, currently married or separate/divorce/widow.), *Ethnicity* (the Kinh, the largest ethnic group in Vietnam or the ethnic group), *Educational levels* (completed primary or less, lower secondary, higher secondary school, and college or above degrees), *Residence* (urban or rural areas), *Main occupation* (unskilled, semiskilled, skilled, clerk, professional, or managerial), *Economic status* (5 quintiles from the poorest to the richest group), *Awareness of penalty policy regulations in ban places* (aware or not about the penalties for smoking in places where it is no longer allowed).

Data analysis. Descriptive statistics were undertaken to depict an overall picture of the current state of public exposure to secondhand smoke and reaction toward smoke-free environment policy regulations. χ^2 test was employed to compare dependent variables of interests by selected socio-demographical characteristics. Logistic regression was performed to assess the factors associated with respondents cautioning smokers to stop smoking when seeing them violate smoke-free regulations. The final model was determined using indices of model fit (p-values of the model coefficients < 0.05 and the Hosmer and Lemeshow test statistic > 0.05) [18].

Research ethics. This study was ethically approved by the Institutional Review Board, Hanoi Medical University, Vietnam. The survey was anonymous and voluntary.

Results

SELECTED SOCIO-DEMOGRAPHIC CHARACTERISTICS OF THE STUDY POPULATION

Of the 8,996 respondents who completed the interview, 48.6% were men and 51.4% were women. By age group, people age 25-44 made up the largest proportion (41.9%) and those 65 and above accounted for the smallest share (8.8%). Two-thirds of people aged 15 old and over were living in rural areas. The majority of the study population reported having lower secondary school education (52.5%) or primary or less education (26.0%). People with a college degree or above made up 7.2% of the study population. The main occupation of the study population was farmer (49.6%), followed by service/sales (19.2%) and production/driving (12.9%). Other occupations were manager/professional (6.6%), construction/mining (5.2%), office workers (2.0%), forestry/fishing (1.8%) and other (2.7%).

PUBLIC EXPOSURE TO SECONDHAND SMOKE IN PUBLIC PLACES

Table I shows percentages of respondents who were exposed to and inhaled tobacco smoke when visiting vari-

Tab. I. Percentage of respondents' exposure to secondhand smoke when visiting various public places during the past 30 days.

Variables (N)	% (95%CI)
Percentage of respondents exposed to secondhand smoke when visiting various public places in the past 30 days	
Government buildings (2,169)	31.12 (29.17-33.07)
Healthcare facilities (2,554)	17.85 (16.37-19.34)
Restaurants (3,326)	81.81 (80.50-83.12)
Bars/Cafes/Tea shops (2,739)	90.07 (88.95-91.19)
Public transport (1,357)	20.04 (17.91-22.18)
Schools (2,575)	15.84 (14.43-17.27)
Universities (376)	36.70 (31.81-41.60)
Percentage of respondents exposed to secondhand smoke when visiting from one to seven public places in the past 30 days (8,987)	
None public place	54.48 (53.45-55.51)
One public place	20.86 (20.04-21.71)
Two public places	17.48 (16.70-18.28)
Three or more public places	7.18 (6.66-7.73)
Percentage of respondents who saw any smokers violating smoke-free regulations (N = 6,985)	
	13.23 (12.43-14.02)

ous public places during the past 30 days. As seen, the rate of respondents exposed to and inhaled secondhand smoke was the highest in bars/café/tea shops and restaurants, followed in universities and government buildings. However, the percentage of respondents who saw any smokers both smoking and violating smoke-free regulations was quite lower (13.23%).

PUBLIC PRACTICE TOWARD SMOKE-FREE ENVIRONMENT POLICY IN VIETNAM

Table II compares, by selected socio-demographic characteristics, percentages of respondents who reminded any smokers to stop when they were violating smoke-free regulations during the past 30 days. Among the respondents who saw smokers violating smoke-free regulations, just 28.25% cautioned them to stop smoking. There were significant differences in the percentage of respondents reminding smokers to stop smoking among age groups, marital status and educational level. A higher rate of advising smokers to stop smoking was found among the respondents who were older, married, and better educated (p < 0.01).

FACTORS ASSOCIATED WITH PUBLIC PRACTICE TOWARD SMOKE-FREE POLICY REGULATIONS

Table III indicates the results of regression analysis of the factors associated with respondents cautioning smokers to stop smoking when they saw them violate smoke-free regulations. As shown, the final model (p-value of model coefficients < 0.05 and p-value of Hosmer and Lemeshow > 0.05) includes four factors, namely marital status, educational level, economic status and awareness of penalty policy regulations in ban places. The respondents who were married (AOR > 1, 95%CI ≠ 1), better educated (AOR > 1, 95%CI ≠ 1) and in lower economic

Tab. II. Percentages of respondents who reminded any smokers to stop smoking when they were violating smoke-free regulations by selected socio-demographic characteristics.

Variables (N=924)	% (95%CI)	*p*-value (χ^2)
Overall	28.25 (25.34-31.15)	NA
Gender		
Male	26.43 (22.34-30.98)	-
Female	29.64 (25.87-33.70)	
Age (years)		
15-24	18.99 (13.88-25.44)	***
25-44	24.37 (20.18-29.11)	
45-64	35.43 (30.22-41.00)	
65+	38.37 (28.67-49.10)	
Ethnicity		
Ethnic minority	26.44 (18.19-36.74)	-
Kinh	28.43 (25.47-31.59)	
Marital status		
Never married	15.87 (11.49-21.50)	***
Currently married	32.10 (28.62-35.80)	
Separate/Divorce/Widow	29.70 (19.73-42.04)	
Residence		
Urban	27.16 (23.68-30.94)	-
Rural	30.06 (25.45-35.11)	
Education Level		
Primary or less	29.05 (22.28-36.90)	**
Lower secondary	28.52 (23.56-34.06)	
Upper secondary	19.50 (14.57-25.60)	
College or above	33.56 (28.36-39.19)	
Occupation		
Unskilled	26.23 (21.58-31.47)	-
Semi-skilled	26.67 (15.70-41.53)	
Skilled	25.00 (9.37-51.81)	
Clerk	28.21 (19.28-39.25)	
Professional	33.55 (26.47-41.46)	
Managerial	37.93 (22.14-56.76)	
Economic status		
Poorest quintile	29.21 (20.67-39.53)	-
Second quintile	30.43 (23.80-38.00)	
Middle quintile	33.07 (25.41-41.74)	
Fourth quintile	27.71 (22.49-33.62)	
Richest quintile	25.17 (20.55-30.42)	

NA: Not applicable; CI: Confidence interval, "-": Not significant. *$p < 0.05$, **$p < 0.01$, ***$p < 0.001$.

Tab. III. Multivariable logistic regression of factors associated with respondents reminding any smokers to stop smoking when they saw them violate smoke-free regulations.

Predictors (N=923)	Reminding smokers to stop smoking	
	AOR	95%CI
Marital status		
Never married	1	
Currently married	2.51	1.64-3.84***
Separate/Divorce/Widow	2.25	1.14-4.42*
Education Level		
Primary or less	1	
Lower secondary	1.24	0.78-1.97
Upper secondary	0.80	0.47-1.36
College or above	1.70	1.03-2.79*
Economic status		
Poorest quintile	1	
Second quintile	0.87	0.48-1.53
Middle quintile	0.97	0.53-1.79
Fourth quintile	0.64	0.36-1.13
Richest quintile	0.52	0.29-0.93*
Awareness of penalty policy regulations in ban places		
No	1	
Yes	1.64	0.89-3.05
Model fit indicators		
p-value of model coefficients	0.000	
p-value [χ^2(df) of Hosmer and Lemeshow]	0.190	
Nagelkerke's R2	3.9%	

AOR: adjusted odds ratio; CI: Confidence interval, *$p < 0.05$, **$p < 0.01$, ***$p < 0.001$.

prevalence in some educational places, but minimally effective in the entertainment places. Compared to five years ago, the percentages of adults' exposure to secondhand smoke in university have declined remarkably from 54.3 to 17.6%, while the proportion of those who were exposed to secondhand smoke in bar/cafes/tea shop and restaurants was still high and has changed slightly from 92.6 to 90.07% and from 84.9 to 81.8% [19]. However, a positive result is that the percentage of adults exposed to secondhand smoke in public transport have declined considerably from 34.4 to 14.4% compared to five years ago [19]. According to Hyland et al. [20], such a decline in some countries can be attributed to the strict enforcement of the smoke-free policy. However, we hold that the strict enforcement in practice may not be equally made across different settings in Vietnam. The compliance would be strictly monitored in one or several areas, but not in the others. Also understandably, at the office areas such as government buildings and health care facilities, the proportion of exposure to secondhand smoke remained quite high and only decreased slightly from 34.8 to 31.1% and from 21.6 to 17.9%, respectively compared to 2010. This finding suggests that communication campaigns and awareness are not the only determinants of smoking behavior [19], but also the broader level of public health intervention is also needed to reduce people's exposure to secondhand smoke in public places.

status (AOR < 1, 95%CI ≠ 1) were more likely to persuade smokers to stop smoking. However, knowledge about penalty policy regulations was not strong enough to affect respondents to remind smokers to stop smoking (OR > 1, 95%CI = 1).

Discussion and conclusions

PUBLIC EXPOSURE TO SECONDHAND SMOKE IN PUBLIC PLACES

Smoke-free environment regulations in Vietnam have been found remarkably effective in reducing smoking

According to the GATS China 2015 country report, the percentage of public exposure to secondhand smoke in public places in China was generally higher than that in Vietnam. The data in China showed that public exposure to secondhand smoke was 93.1% inside bars or night clubs, 76.3% in restaurants, 57.1% in households homes, 54.3% at working places, 38.1% in government buildings, 26.9% in health care facilities, 23.8% in universities, 17.2% in primary and high schools (both indoor and outdoor areas) and 16.4% in public transportation [21]. This finding implies that smoke-free environment policy regulations in Vietnam appear to be effective to some extent. However, smoking in, and/or exposure to secondhand smoke in, public places depends upon many factors, while tobacco control policies or laws are just part of the whole picture, but play an important role. From the policy perspective, we argue that the nature of regulations is also crucial. What is more important is to monitor and supervise the implementation of policies. Tobacco control programs and key stakeholders need to know how tobacco is used, how it is restricted, prohibited and fined as well as how people are protected. According to Vietnam National Assembly [16], if anyone violates smoking bans in the smoke-free areas, they are requested to stop smoking or to leave the facilities or to be refused to services and have to pay fines for violations. However, despite smoking ban signs posted everywhere in public areas, smokers still ignore in some places. This has been blamed for "not strict enough" punishments from authorities [22, 23]. Compared to Japan and Singapore, the penalty for violating smoke-free regulations is about 50 times higher in these countries (240-600 USD in Japan and 140-700 USD in Singapore) [24, 25]. The question is asked now if smoke-free regulations in Vietnam are appropriate and/or powerful enough to prevent and stop people smoking in public places.

PUBLIC PRACTICE TOWARDS SMOKE-FREE ENVIRONMENT POLICY

Since the establishment of smoke-free regulations at work and in public places in Vietnam, there has been increasing attention and support from the majority of adults - both non-smokers and smokers. The Global Adult Tobacco Survey (GATS) in 2010 revealed that the proportion of Vietnamese adults who supported smoke-free environments was quite high, reaching up to 76.2% in bars and 95.3% in public transport [19, 26]. However, there is a gap between attitude and practice. Our study has shown that only 28.3% of respondents cautioning the others to stop smoking in smoke-free areas, which also means that more than 70% of respondents are tolerant to tobacco smoke in smoke-free areas. This result is similar to a study among hospitality venue owners and employees in 7 cities of Turkey where 71.3% of participants displayed a positive attitude towards the smoke-free law, but only 19.5% of participants reported requesting customers or employees to stop smoking in the venues [27]. The practice of intervening a smoker who is both smoking and violating smoke-free regulations plays an important role in tobacco control for several reasons. First,

in resources-contrained settings such as in Vietnam, the government, tobacco control program and relevant stakeholders can not arrange people or teams to regularly and directly inspect or check people's compliance with smoke-free regulations in banned places. Second, we argue that the model of cautioning smokers to cease their smoking appears feasible as we can mobilize social and community participation in tobacco control. However, this intervention should be conducted in a friendly manner and actors should be equipped adequate skills to do such. The information on the effect of such a model is important to inform tobacco control initiatives. However, in the current design of GATS, there is no question or measure to assess the effect of respondents who cautioned people who were both smoking and violating the rules. We could know how many respondents who intervened a smoker violating the rules; yet, we do not know how many smokers requested by responents successfully stopped smoking or at least smoked in permitted areas. As there is a gap between attitude and practice, there should be barriers, reasons and factors that could help to explain this phenomenon. The study in China by Yang et al. [28] indicates that lack of comprehensive laws, inappropriate penalties and a combination of weak public health education are the barriers for success of smoke-free regulations. One more important factor are unmet public expectations, which, according to Yang et al., have motivated many governments to continue to work on their own smoke-free policies [28]. The study of Yang et al. emphasizes the importance of revising or strictly monitoring smoke-free regulations to meet the requirements of the WHO FCTC [28].

In this study, we found that the older, married and higher educated respondents were more likely to remind a smoker to stop smoking in prohibited areas than the remaining groups and the difference was significant. Similarly, a study by the Ministry of Health of Vietnam et al. in 2010 [19] also reported that the higher proportion of supporting for smoke-free law fell on the group of the older age, married and higher educational attainment. The reason is that these people are more knowledgeable about the health effects of secondhand smoke and show more positive attitudes towards smoke-free law [27, 29]. Interestingly, we found that people with lower economic status such as in the second and middle quintile were more likely to request smokers to stop smoking than those in the fourth and richest quintile. This result is not in concert with the study by An et al. [30] showing that people with higher income demonstrated more positive attitudes towards "no smoking at workplaces" and at "public places".

FACTORS ASSOCIATED WITH PUBLIC PRACTICE TOWARDS SMOKE-FREE POLICY REGULATIONS

Four predictors associated with the response of the people to speak up to any smokers to stop smoking in smoke-free areas were detected. To begin, we found that the currently married respondents were more likely to remind smokers if they noticed them violate smoke-free areas. Other studies outside Vietnam such as those by

Cheng et al. [31] and by Kruger et al. [32] also found that people who were aged, male, married and highly educated tended to practice 100% smoke-free home rule in America. It seems that married people are more aware of the risk of smoking and more responsible for the health of their own family especially their kids, hence more likely to follow smoke-free regulations. The second factor is educational level. Some previous studies indicate that the educational attainment is one of the key elements for the success of smoke-free policies [1, 27, 33]. According to the Ministry of Health of Vietnam et al. [19] and Thrasher et al. [33], the group with higher education was more likely to support the smoke-free policy. In our current study, the respondents with higher educational level were also more likely to practice more the rights and responsibility to stop smokers in prohibited areas. This can be explained that educational attainment could contribute to better awareness of the health risk of smoking and the understanding of the national smoke-free environment regulations as well as the law on tobacco control.

In terms of economic status, contradictory to our expectations, the poorest was more likely to ask smokers to stop smoking than the richest. This finding suggests a gap between attitude and practice of the poor against the violation of smoke-free regulations. On the contrary to the study finding by An et al. [30], the poorer were less likely to support smoke-free policy. This difference could be explained by some hidden factors such as social norms as many scientists defined as "unwritten rules about behaviors" [5, 33-36]. Qualitative research in some developing countries has also revealed a number of social factors associated with tobacco control practices, including social norms [35].

Our study has some limitations. As a cross-sectional design, the direction of effects may not be determined. Further, because this is a quantitative study, it is difficult to identify the reasons behind the key findings as indicated by the quantitative study. Also, due to the limited scope of our study which focused largely on the variables included in the GATS questionnaire, we could not have an opportunity to explore other complex factors such as social norms and social contexts that also play an important role in explaining the phenomenon. It is expected, therefore, that future research use either longitudinal design using mixed methods, both quantitative and qualitative approaches.

Despite its limitations, as a large scale design using globally recognized systematic and standardized methods, this study can provide a strong case for tobacco control recommendations. To reduce smoking and public exposure to secondhand smoke, it is crucial to strengthen two of the six MPOWER components of WHO. Besides public awareness raising campaigns, it is important to continue monitoring tobacco use and smoke-free regulation adherence of the public to provide evidence for tobacco control initiatives. Another strategy is to find more innovative ways to protect people from tobacco smoke. A good example of this would be to use a peer model to motivate public to caution smokers to stop smoking.

It is also recommended that the government continue to adapt or modify the existing smoke-free regulations to meet public expectations. People to caution tobacco control violators should be well-prepared such as mature and better educated as they have been believed to be self-confident to offer advice on stopping violation and smoking. It should be noted, however, that the process of change require continued commitment from the government as well as active participation of many related actors and stakeholders at all levels. As Vietnam has much in common with other developing countries in Southeast Asia, this research could provide evidence for useful policy and practice for tobacco control in similar countries.

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Conflict of interest statement

None declared.

Authors' contributions

HVN outlined the manuscript, analyzed the data, drafted and revised the manuscript. ADD and HTTD wrote some parts of the manuscript. ATMD advised and edited the manuscript. GBK, HTP, HTD, KNL, LTN, MVH, NQP and QTN designed research proposal and tools and managed data collection. All authors read and approved the final manuscript.

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