

RESEARCH ARTICLE

Students' Knowledge and Attitudes Towards Smoke-Free Universities: Changes Since Enactment of Vietnamese Tobacco Control Legislation

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Abstract

Background: In 2013, legislation in Vietnam regulated smoking in public areas. Included was a ban on indoor smoking at universities. **Objective:** Since awareness and attitude are moderators of the effectiveness of smoke-free policy, our aim was to assess changes in students' knowledge and attitude toward second hand smoke (SHS) and awareness and support of smoke-free legislation at four Vietnamese universities, one year after legislative changes. **Methods:** A two-phase cross sectional study of undergraduate students using self-administered questionnaires (based on the Global Adult Tobacco Survey and the Thrasher survey) was conducted at the introduction of the legislation and one year thereafter. **Results:** One-year post legislation there were significant increases in knowledge of smoke-free legislation and awareness of universities as smoke-free environments. There was a significant increase in knowledge of harmful effects of SHS on diseases such as examples in the heart and lung, including lung cancer, and miscarriage. Students expressed strong support of smoke-free environments in universities, hospitals, schools, workplaces, public transport, libraries, cinemas and theatres; support was also increased post legislation. Changes were seen in attitude to SHS, and rights of non-smokers and smokers. **Conclusions:** Positive changes have occurred in knowledge and attitude toward smoke-free environments and SHS in universities since enactment of Vietnamese tobacco control legislation.

Keywords: Smoke-free environment - university - undergraduate students - knowledge - attitude

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Introduction

The health effects of tobacco are a major public health issue globally. It is estimated that tobacco use is responsible for up to 90% of lung cancers, 30% of all cancers, 75% of chronic obstructive pulmonary disease (COPD), and 35% of ischemic heart disease (Mather and Lonca (2006). The World Health Organization (WHO) also states that 14% of deaths in men and 11% of deaths in women in the Western Pacific region could be attributed to tobacco use. In Vietnam, non-communicable diseases are on an increasingly upward trend, accounting for more than 62% of all hospital deaths, 17% of all deaths, and 21% of deaths caused by non-communicable diseases (2012a).

Creating a smoke-free environment has been found to have an important impact on the health of nonsmokers, as well as smokers (Ong and Glantz, 2004; Hahn et al., 2006; Rayens et al., 2008). It creates a supportive environment for smokers to quit or reduce smoking (Hahn et al., 2008; Ritchie et al., 2010), while it does not have any negative impact on business and doesn't increase smoking at home (Corsun et al., 1996; Lal et al., 2004; Mons et al., 2012).

Vietnam is one of the 15 countries in the world with the highest prevalence of male smokers (47.4%), while only 1.4% of females are smokers (MOH, 2010). Apart from the direct use of tobacco products, secondhand smoke (SHS) exposure is also a significant issue, with more than 33 million adults exposed to SHS at home, and around 38 million exposed to SHS in workplaces (MOH, 2010). The Global Adult Tobacco Survey (GATS) in Vietnam found that, among public places, restaurants and bars showed some of the highest incidences of violations of smoking bans exposure to SHS (89.7%), followed by universities (54.3%), government offices (38.7%) and public transportation (34.4%) (MOH, 2010).

Vietnam ratified the Framework Convention on Tobacco Control (FCTC) in 2004 and, together with other countries, issued legislation to implement the setting up of smoke-free public places, such as the Prime Minister's Directive No12/CT-Ttg on strengthening tobacco control (2000), and the Prime Minister's Decision 1315 to establish the National Plan for WHO FCTC implementation (2009). However, smoking in public and workplaces is still common in Vietnam. Most recently,

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the Law on Tobacco Control was passed by members of the National Assembly on 18 June 2012, and came into effect on 1 May 2013. This study aims to evaluate the changes in students' knowledge and attitude of second hand smoke (SHS) and awareness and support of smoke-free legislation at four Vietnamese universities in one year after legislative changes

Materials and Methods

Study location

The study was conducted at four universities selected representatively for three main geographical regions in Vietnam (the University of Thai Nguyen and Foreign Trade University in the North; the University of Hue in the Centre and the University of Dong Thap in the South of Vietnam).

Study design

A pre-experimental design was employed to evaluate changes in support, compliance with smoke-free implementation, and exposure to SHS 1 year after implementation of the Tobacco Control Law and its guiding decree 176/ND-CP/2013. The new Law, its decree and the regulations put in place at the study universities are viewed as the intervention that is evaluated in this study. Baseline survey was done in December 2013 when Decree 176/ND-CP/2013 was issued, and post intervention was conducted 1 year after Phase 1.

Sample size and sampling process

The total size was calculated using sample size to compare two proportion

The sample size was calculated using the two-sided test of comparison between groups:

$$n = \left\{ \frac{Z_{1-\alpha/2} \sqrt{2\bar{p}(1-\bar{p})} + Z_{1-\beta} \sqrt{p_1(1-p_1) + p_2(1-p_2)}}{(p_1-p_2)^2} \right\} \times \text{D.E.} \times \text{Allowance for non-response}$$

The sample size computations were based on the following parameters: significance =95%; power =90%; $p^2= 0.023$ (rate of reporting change in exposure to SHS in Thrasher (2010)).

Difference to be detected = 4 percentage points (= p^1-p^2 in the attached sample size formula), assuming the similar rate of higher risk intercourse in a compared group is $p^1=0.063$. Design effect = 1.2 (based on previous studies of this type worldwide); allowance for non-response =

5%. The total sample size needed for each university was 800 students.

Total estimated sample size was 800 students. In both survey, single-stage cluster sampling was used to choose subjects from each selected university. The clusters in this study were defined as classes (average 30-100 students), and so in total approximately 25 classes were surveyed for each university, randomly selected from the list of classes in Years 1, 2 and 3. All the students in the selected classes were invited to voluntarily participate in the study. Students in the final year were not selected, as they were doing fieldwork and/or data collection for their theses and hence were frequently absent from campus.

Measurements and analytical approach

Quantitative questionnaires were developed based on previous questionnaires on SHS exposure, and support and compliance for smoke-free policies from previous studies. Major themes for knowledge and attitude evaluated in this study included knowledge about smoke-free policies for indoor areas, knowledge about university's policies regarding indoor smoke free; attitude toward indoor smoke and toward the implementation of smoke free

Data were entered and managed by EpiData software and were analysed using SPSS18.0 software. Appropriate descriptive statistics, including means and percentages, were used to present the main indicators. Chi-square tests were used to compare the differences between proportions in the two phases.

Ethical approval

All respondents were adults and voluntarily participating in the study. Participants were given an information sheet about the research and their rights to voluntarily participate or refuse. The consent was included in the questionnaire on the first page. All personal information is accessible only to the principal investigator and supervisors. Data are secured in safe storage that is only accessed by principal investigator. All computerised data are kept confidential, and only the study team had access to them. Ethical clearance requests were submitted to the Hanoi School of Public Health Ethics Committee and the University of Queensland Ethics Committee, and approvals obtained: from HSPH (No 127/2013/YTCC – HD3 on 26 April 2013) and UQ (Approval number 2013000614 on 14 May 2013).

Results

Characteristics of study samples

At all universities, female students were the majority

Table 1. Characteristics of Study Samples

Characteristics	University of Hue		Foreign Trade University		University of Dong Thap		University of Thai Nguyen	
	Phase 1	Phase 2	Phase 1	Phase 2	Phase 1	Phase 2	Phase 1	Phase 2
Male	275 (34.7%)	227 (31.4%)	213 (27.7%)	165 (21.4%)	339 (39.1%)	253 (36.0%)	316 (39.6%)	244 (33.2%)
Female	517 (65.3%)	495 (68.6%)	555 (72.3%)	606 (78.6%)	528 (72.3%)	450 (64.0%)	481 (60.4%)	490 (66.8%)
Age	20.5 + 1.2	20.6 + 1.8	20.1 + 1.4	19.6 + 0.6	19.9 + 1.2	19.7 + 1.2	19.8 + 1.0	20.3 + 1.4

with more than 60% of students were female. The mean age of students of four universities were approximately 20 years old as they were at year 1, 2 and 3 of the university

Changes in knowledge after intervention

Table 2 presents the changes in student's knowledge of the smoke-free Law and how it is implemented in the university setting. Under the Tobacco Control Law,

smoking is prohibited in all indoor areas of the university. Correct knowledge was defined as students answer "Tobacco smoking is not allowed anywhere in indoor areas". As shown in Table 2, the percentage of students who had a high level of knowledge of the smoke-free Law is low. Across all universities, approximately only one-third of students both in Phase 1 and Phase 2 correctly answered that smoking is prohibited in all indoor areas. In

Table 2. Proportion of Students who Acknowledged the Smoke-free Component in the Tobacco Control Law Correctly for the University Setting

Knowledge of smoke-free policies for indoor areas	University of Hue		Foreign Trade University		University of Dong Thap		University of Thai Nguyen		Total	
	Phase 1	Phase 2	Phase 1	Phase 2	Phase 1	Phase 2	Phase 1	Phase 2	Phase 1	Phase 2
Tobacco smoking is allowed everywhere	14	15	14	16	14	11	15	10	57	52
	1.80%	2.10%	1.80%	2.10%	1.60%	1.60%	1.90%	1.40%	1.80%	1.80%
Tobacco smoking is allowed in some indoor areas	140	162	206	256	165	137	125	162	636	717
	17.6%	22.6%	26.8%	33.5%	19.0%	19.5%	15.6%	22.3%	19.7%	24.6%
Tobacco smoking is not allowed anywhere in indoor areas	222	257	230	260	329	228	264	251	1045	996
	28.0%	35.8%**	29.9%	34.0%	37.9%	32.5%*	32.9%	34.5%	32.3%	34.2%*
There is no law	126	55	49	42	64	74	59	38	298	209
	15.9%	7.70%	6.40%	5.50%	7.40%	10.5%	7.30%	5.20%	9.20%	7.20%
Other	66	42	36	26	61	31	66	59	229	158
	8.30%	5.80%	4.70%	3.40%	7.00%	4.40%	8.20%	8.10%	7.10%	5.40%
Do not know	226	187	234	165	234	221	274	208	968	781
	28.5%	26.0%	30.4%	21.6%	27.0%	31.5%	34.1%	28.6%	29.9%	26.8%
Total	794	718	769	765	867	702	803	728	3233	2913
	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%

* p<0.05, ** p<0.01

Table 3. Students' Acknowledgement of the Smoke-free Policies Issued by their University

Correct knowledge of university smoke-free policies for indoor areas	University of Hue		Foreign Trade University		University of Dong Thap		University of Thai Nguyen		Total	
	Phase 1	Phase 2	Phase 1	Phase 2	Phase 1	Phase 2	Phase 1	Phase 2	Phase 1	Phase 2
Indoor smoking is allowed	27	20	14	19	18	25	15	10	74	74
	3.40%	2.80%	1.80%	2.50%	2.10%	3.60%	1.90%	1.40%	2.30%	2.60%
Indoor smoking is not allowed, but there are exceptions	131	68	81	97	108	100	71	81	391	346
	16.5%	9.60%	10.5%	12.6%	12.5%	14.3%	8.90%	11.3%	12.1%	11.9%
Indoor smoking is never allowed	374	430	389	420	531	401	397	406	1691	1657
	47.1%	60.4%***	50.3%	54.8%	61.2%	57.2%	49.6%	56.5%*	52.3%	57.2%***
There is no indoor smoking regulation	62	47	74	27	46	29	115	25	297	128
	7.80%	6.60%	9.60%	3.50%	5.30%	4.10%	14.4%	3.50%	9.20%	4.40%
Do not know	200	147	216	204	164	146	202	196	782	693
	25.2%	20.6%	27.9%	26.6%	18.9%	20.8%	25.3%	27.3%	24.2%	23.9%
Total	794	712	774	767	867	701	800	718	3235	2898
	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%

* p<0.05, *** p<0.001

Table 4. Proportion of Students with Appropriate Attitudes Towards SHS

Statement	University of Hue		Foreign Trade University		University of Dong Thap		University of Thai Nguyen		Total	
	Phase 1	Phase 2	Phase 1	Phase 2	Phase 1	Phase 2	Phase 1	Phase 2	Phase 1	Phase 2
Smokers have a right to smoke in smoke-free areas	635	600	680	634	791	633	603	626	2709	2493
	80.0%	83.1%	87.9%	82.2%**	91.2%	90.0%	75.1%	85.3%***	83.7%	85.1%
If someone does not want to breathe cigarette smoke, then they should go somewhere else	407	362	479	436	478	303	388	415	1752	1516
	51.3%	50.1%	61.9%	56.5%*	55.1%	43.1%***	48.3%	56.5%***	54.1%	51.7%
Nonsmokers have a right to breathe air without tobacco smoke	627	510	661	656	710	607	622	557	2620	2330
	79.0%	70.6%***	85.4%	85.1%	81.9%	86.3%*	77.5%	75.9%	80.9%	79.5%
Nonsmokers don't have to worry about being with smokers in the same room	386	555	527	632	529	567	560	595	2002	2349
	48.6%	76.9%***	68.1%	82.0%***	61.0%	80.7%***	69.7%	81.1%***	61.8%	80.2%
Smoke-free policy improves the health of non-smokers	610	466	623	586	716	578	587	546	2536	2176
	76.8%	64.5%**	80.5%	76.0%*	82.6%	82.2%	73.1%	74.4%	78.3%	74.3%
Smoke-free policy improves the health of smokers	525	357	486	534	549	529	473	432	2033	1852
	66.1%	49.4%***	62.8%	69.3%**	63.3%	75.2%***	58.9%	58.9%	62.8%	63.0%

* p< 0.05, ** p< 0.01, *** p< 0.001

both Phase 1 and Phase 2, approximately 10% of students thought that there was no Law, and approximately 30% did not know what the Law stipulated. It was observed that the % answered correctly for the question “Tobacco smoking is not allowed anywhere in indoor areas” increased significantly in all participated universities, most evidently in University of Hue (from 28.0% to 35.8%).

Table 3 showed the student acknowledgement of smoke free policies issued by their own universities. All of the four universities had their own smoking bans in indoor areas before Phase 1 of the study was conducted. Correct knowledge was defined as students answer “Indoor smoking is never allowed”. Results in Table 3 shows that the prevalence of students who correctly acknowledged the universities’ policies was approximately 50%, increasing significantly in Phase 2 compared to Phase 1 at the University of Hue (from 47.0% to 60.4%), FTU (from 50.3% to 54.8%) and University of Thai Nguyen (from 49.6% to 56.5%). At the University of Dong Thap, there was no significant change in Phase 2 compared to Phase 1.

Change in attitude after intervention

Table 4 indicates the changes in student’s attitude after 1 year intervention. Likert scale was used to evaluate attitude (5 scales from strongly disagree to strongly agree). An appropriate attitude was defined as follows: (1)Smokers have a right to smoke in smoke-free areas

(appropriate attitude is strongly disagree or disagree (2) If someone does not want to breathe cigarette smoke, then they should go somewhere else (appropriate attitude is strongly disagree or disagree) (3) Nonsmokers have a right to breathe air without tobacco smoke (the appropriate attitude is strongly agree or agree) (4) Nonsmokers don’t have to worry about being with smokers in the same room (appropriate attitude is strongly disagree or disagree) (5) Smoke-free policy improves the health of non-smokers (appropriate attitude is strongly agree or agree) and (6) Smoke-free policy improves the health of smokers (appropriate attitude is strongly agree or agree)

Table 4 reports the percentage of students having appropriate attitude on SHS.

The percentage of students who had an appropriate attitude to the statement “Smokers have a right to smoke in smoke-free areas” slightly increased in phase 2 at the University of Hue and significantly increased at the University of Thai Nguyen. At the FTU, the percentage of students with the appropriate attitude decreased significantly while at the University of Dong Thap there was an insignificant decrease.

For the statement “Nonsmokers have a right to breathe air without tobacco smoke”, a significant decrease was found at the University of Hue and non-significant decreases were found at the FTU and the University of Thai Nguyen. In contrast, the students’ attitude at

Table 5. Proportion of Students who Supported a Ban on Tobacco Smoking on the University Campus

	University of Hue		Foreign Trade University		University of Dong Thap		University of Thai Nguyen		Total	
	Phase 1	Phase 2	Phase 1	Phase 2	Phase 1	Phase 2	Phase 1	Phase 2	Phase 1	Phase 2
Just indoors at the university	315 39.7%	427 59.9%***	353 45.7%	405 52.7%**	409 47.2%	377 53.8%*	369 46.0%	383 53.3%**	1446 44.7%	1592 54.9%***
Both indoors and outdoors at the university	542 68.3%	504 70.7%	571 74.0%	541 70.4%	640 73.9%	517 73.8%	540 67.2%	514 71.5%	2293 70.9%	2076 71.5%

the University of Dong Thap increased significantly in phase 2.

For the statement "Nonsmokers don't have to worry about being with smokers in the same room", there was a significant increase in the appropriate attitude at all four universities.

At the Universities of Hue and FTU, there were significant decreases in the percentage of students with an appropriate attitude to the statement "Smoke-free policy improves the health of non-smokers", while at the other universities no significant changes were found.

Students at the University of Hue had a significant decrease in the appropriate attitude toward the statement "Smoke-free policy improves the health of smokers", while at the FTU and the University of Dong Thap student attitude increased significantly. There was no change at the University of Thai Nguyen.

The percentage of students with the appropriate attitude for the statement "If someone does not want to breathe cigarette smoke, then they should go somewhere else" was low and decreased significantly in phase 2 at the Universities of Dong Thap and FTU, slightly decreased at the University of Hue and significantly increased at the University of Thai Nguyen.

Table 5 also presents the % of students supporting the ban of tobacco smoking on the university campus. In all universities, the proportion of student showing their support for the implementation of indoor smoke free policies (overall, in increase of 10.2% estimated). Approximately 70% of students supported a total ban on smoking at universities. This support increased between Phase 1 and Phase 2; however, the increase was not significant. A lower percentage of students supported a ban only on smoking indoors. At all four universities and in the overall results, there was a significant increase between Phase 1 and Phase 2 in support for an indoor smoking ban

Discussion

Regarding awareness of the Tobacco Control Law and university-specific regulations, the percentage of students from all the universities combined who chose the correct answer ("Tobacco smoking is not allowed anywhere in indoor areas") in relation to the Tobacco Control Law increased significantly ($p < 0.05$) one year after the enactment of the legislation. There was a significant increase in correct answers by the students from the University of Hue; however, there were non-significant increases by the students from the FTU and the University of Thai Nguyen. At the University of Dong Thap, there

was a significant decrease in correctly answering this question.

One year after the introduction of the Tobacco Control Law, more students knew about the universities' regulations (57.2%) than the national legislation (34.2%). The percentage of students in three of the four universities (the University of Hue, the FTU and the University of Thai Nguyen) who correctly knew about the universities' regulations increased in Phase 2, with significant increases at the universities of Hue and Thai Nguyen, and a non-significant increase at the FTU. The percentage of students at the University of Dong Thap who knew about the university regulations reduced slightly, but non-significantly from 61.2% to 57.2%. However, this was still higher than the percentage of students who knew correctly about the national Law (37.9% in Phase 1 and 32.5% in Phase 2).

A study in Australia at Curtin University found similar results for student awareness of an institutional smoke-free policy, with only 56% of students aware that the university had a tobacco policy (Burns et al., 2013). This is comparable to the current study, where 57.2% were aware of the smoke-free policy in Phase 2. The percentage of smokers aware of the Curtin University policy (72.2%) was significantly higher than the percentage of ex-smokers (67.3%) and non-smokers (52.5%) (Burns et al., 2013).

The level of knowledge of students about the possible general harmful effects of SHS on nonsmokers was very high in both Phase 1 and Phase 2. In the combined student group, the knowledge in Phase 2 was significantly higher than in Phase 1. There was a significant increase of knowledge at the University of Thai Nguyen, and non-significant increases at the University of Hue and the FTU. However, there was a significant decrease in knowledge at the University of Dong Thap. For staff, there were minor changes in both directions; however, there were no significant changes in the knowledge of the harmful effects of SHS. Students' knowledge in relation to specific diseases caused by SHS considerably increased compared to staff knowledge.

Similar results were found in a study from Saudi Arabia (Almutairi, 2014), which indicated that 86.8% of university students who smoked were aware that SHS could harm nonsmokers. The percentage was much higher (97.6%) in nonsmoking students.

Regarding support for smoke-free policies, students were asked if they supported a ban on indoor smoking and a total ban on smoking. Approximately 70% of students across all universities supported a total ban on smoking in both Phase 1 and Phase 2 of the study. Although there

were minor variations between Phase 1 and Phase 2 among the students at different universities, in all universities and the combined group no significant changes were found. Paradoxically, fewer students favoured a smoking ban restricted to indoor smoking (Phase 1, 44.7%; Phase 2, 54.9% (combined results)). However, there was a significant increase for support of an indoor smoking ban in Phase 2. It would seem that students prefer the implementation of a total ban on the campus, rather than restricting the ban to indoor areas.

A study in Saudi Arabia (Almutairi, 2014) showed strong support among nonsmokers for a total ban at a university (97.4% of students, 75.3% of academics, and 87.4% of staff), while support among smokers was significantly lower (75.1% of students, 63.2% of academics and 26.1% of staff). In another study, the support for a total smoking ban at Curtin University in Australia was lower than the above study, with 70.4% of staff and 74.7% of students agreeing that a completely smoke-free campus has a positive effect on quality of life (Burns et al., 2013).

In the current study, the support for an indoor smoking ban among students significantly increased in Phase 2 for workplaces, restaurants, libraries, cinemas, theatres and community culture houses, but increased non-significantly for bars and places of worship, and decreased non-significantly for public transport. Except for bars, the percentage of students who supported a ban at the nominated public places was high, ranging from 73.1% to 93.4% across both phases of the study. For bars, only 48.3% of students in Phase 1 and 49.8% in Phase 2 supported a ban on smoking.

The pattern for staff in relation to indoor smoking at public places varied, in that there were no significant increases between Phase 1 and Phase 2 for any location, while slight increases occurred in five locations, slight decreases in four locations, and a significant decrease for places of worship.

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