

RESEARCH ARTICLE

Gender Differences in Responses towards Anti-Smoking Messages and Policy Implementation among Future Doctors in Malaysia

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Abstract

Background: Medical students' views may provide some direction for future policy considerations. **Aim:** The aim of this study was to assess gender differences in future doctors' receptiveness to currently implemented anti-smoking messages and the effectiveness of those messages. **Materials and Methods:** We administered a questionnaire to all students at a medical university in Malaysia, asking how frequently they noted anti-smoking policies, anti-smoking campaigns, and anti-smoking messages in schools. In addition, the questionnaire investigated most effective methods to convey these messages. **Results:** A total of 522 (59.7%) students responded. Students were least likely to approve of total bans on cigarettes and increasing the price of cigarettes, and most likely to approve of bans on use of cigarettes in public places and sales to individuals less than 16 years old. Approval of total bans on cigarettes was more common in female students than in males OR=0.39 (95% CI: 0.18-0.86). Furthermore, compared to the female students, the male students thought that printed media; OR=2.32 (95% CI: 1.31-4.10), radio; OR=1.93 (95% CI: 1.15-3.22) and the internet; OR=1.96 (95% CI: 1.15-3.33) were very effective at delivering anti-smoking messages. **Conclusions:** Gender differences existed in the future doctors' perception of the effectiveness of anti-smoking initiatives. Taking this gender difference into account may increase the receipt of anti-smoking messages in adolescents.

Keywords: Cigarette - health policy - media exposure - medical students - Malaysia

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Introduction

Smoking presents an important global challenge for public health policy makers (Max, 2001; Asbridge, 2004). According to the World Health Organisation, smoking is the second most common cause of death and the fourth most common risk factor for disease worldwide. If current trends continue, smoking may cause 8 million deaths by 2030, with 80% of the deaths occurring in middle- and low-income countries (Organization, 2011). Medical professionals play an important role in the prevention of tobacco use and have a strong influence on the development of public health policy (Smith and Leggat, 2007; Tee, 2012). Hence, doctors should acquire knowledge about tobacco control in medical school. Nevertheless, only 5.2-32.6% of future doctors around the world received formal training about tobacco during medical school (Warren, 2008).

Advocacy for tobacco regulation in Malaysia has progressed slowly since it began in the 1970s. The prevalence of smoking in men increased from 41.0% in 1986 to 49% in 1996, then decreased slightly to 46.0%.

The prevalence of smoking in women remained steady at 4.0% in 1986 and 1996, then decreased to 2.0% (Zariah, 2007). Despite this decrease, the prevalence of smoking in Malaysia was higher than that reported in neighbouring countries such as Thailand and Singapore (36.9% and 21.8% of men and 2.0% and 3.5% of women, respectively) (Gainroj et al., 2010). Thus, Malaysia has become an example of the success the tobacco industry can achieve when it is allowed to conduct its business with little constraint (Assunta and Chapman, 2004a; 2004b).

However, in conjunction with their ratification of the Framework Convention of Tobacco Control (FCTC), the first international public health treaty, the Malaysian government has begun using multiple approaches to tobacco control. These approaches include introducing anti-tobacco campaigns (e.g., TAK NAK campaign); increasing taxes and the price of cigarettes; prohibiting sales to minors; and regulating tobacco product packaging. The Control of Tobacco Product Regulation (CTPR) placed direct and indirect bans on tobacco advertising; enacted comprehensive bans on tobacco promotion and sponsorships; and took steps to combat tobacco smuggling

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(Zariyah et al., 2007). We also promoted public awareness through media sources such as radio, billboards and television and regulated the creation of cessation clinics and programmes in hospitals, clinics and workplaces (Zariyah et al., 2007; Wee, 2011; Yasin, 2011; 2012). However, these activities were not properly evaluated. We also do not know to what extent anti-smoking messages were delivered and whether they reached the intended target group.

Previous research has shown diverging trends in smoking between men and women. In adolescent Malaysians, smoking prevalence is higher in males (26.2%) than in females (3.0%). However, among younger cohorts in western countries, the prevalence of female smoking has increased exponentially and now exceeds that of male smoking (Lundborg and Andersson, 2008). Morbidity and mortality statistics reflect this narrowing of the gender gap (Pampel, 2002). The underlying reasons for the difference in smoking behaviour are varied (Lundborg and Andersson, 2008). For example, male youth are more likely to undertake risky behaviours like smoking than are female youth, although this difference is diminishing as more females smoke. Despite gender differences in mortality due to smoking, which may result from women's increased sensitivity to the harmful effects of smoking (Risch et al., 1993; Xu, 1994), social and cultural norms that have traditionally prevented women from smoking are weakening. Among medical students, there are gender differences in exposure to second hand smokers, knowledge about tobacco, and the perception of tobacco smoking as an addiction, habit or illness (Janik-Koncewicz et al., 2012).

This paper extends the analysis of gender differences in the perception of anti-smoking media and policy implementation to include the perspectives of future doctors. Increased knowledge about how these perceptions differ between males and females may lead to more effective tobacco control activities. To the best of our knowledge, no prior studies have focused on this issue.

Materials and Methods

Design

This cross-sectional study was conducted at one of the largest public universities in the Klang Valley in Malaysia. The data were collected from May 2010 to September 2010. Medical students in years 1-5 of their training, all of whom lived in university-provided hostels, were invited to participate. Students had received a minimum of two hours of lectures about the epidemiology of smoking and smoking-related effects during the preclinical years, and some informal teachings during the clinical years. Students were invited to participate in this study through announcements by student organizations, emails and classroom visits.

Procedure

Participation was voluntary; all participants provided written informed consent. A standardised, self-administered, paper questionnaire was given to each participant. The questionnaires were collected

immediately after they were completed. The research was approved by the ethical committee of the university.

Participants

Of 875 medical students, 59.7% responded. The respondents included 176 students from year 1, 31 students from 2 years, 133 from 3 years, 144 from 4 years and 66 from the final year (5 years). The most common reason for nonresponse was that students were too busy due to lectures, clinical postings or upcoming graduation. Some students simply failed to return the questionnaire after it was distributed.

Measures

The measures for this study were developed based on group discussions with students, which were held during lecture classes. All respondents completed a questionnaire about sociodemographic characteristics, smoking history and the perception of anti-smoking messages. The questionnaire took 15 minutes to complete.

Sociodemographic characteristics and smoking history: Sociodemographic characteristics included gender (male or female), marital status (single or married), year of study (1-5) and the various races in Malaysia. The smoking history questions included: have you ever smoked even a puff of a cigarette (yes or no); age when you started smoking (never smoked even a puff, <8, 8-12, 13-16 or >16 years); and number of cigarettes smoked per day (0, 1-5, 6-14, 15-20, or >20).

Exposure to anti-smoking messages and efforts of tobacco companies: Exposure to media messages and the efforts of tobacco companies was measured by asking 1) How many anti-smoking messages did you receive within the last 30 days via the following means: radio, printed materials, billboards, television, and internet? 2) Do you own any items from the tobacco companies? and 3) Have you received any offers of free cigarettes from tobacco companies? The response categories for all three questions were a lot, some and never.

Perception of approaches to reducing cigarette smoking: The two questions about student perceptions asked about approaches that are currently implemented in Malaysia and those suggested by students during group discussions held as part of a lecture. The first question asked what do you think is the best way to reduce cigarette intake, and the responses included the following list of approaches: a) total ban on the sales and use of cigarettes; b) increasing the price of cigarettes; c) ban on smoking in public places; d) ban sales to individuals <16 years old; e) ban on smoking in workplaces; f) conduct anti-smoking campaigns; and g) make delivery of anti-smoking messages compulsory in schools. The second question explored student perception of which types of media were most effective for delivering anti-smoking messages. The media of interest included radio, printed materials, billboards, television and internet. The response categories for both questions were strongly agree, agree, slightly agree, disagree and strongly disagree.

Table 1. Baseline Characteristics of Respondents Included in the Analysis (N=522)

Baseline characteristics of respondents	n (%)
Demographic variables;	
Gender:	
Male	127 (24.3)
Female	395 (74.7)
Marital Status:	
Married	9 (1.7)
Single	513 (98.3)
Year of Study in Medical School:	
1	176 (33.7)
2	31 (5.9)
3	133 (25.5)
4	116 (22.2)
5	66 (12.6)
Race:	
Malay	515 (98.7)
Chinese	1 (0.2)
Indian	1 (0.2)
Others	5 (1.0)
Smoking History;	
Tried smoking a puff of cigarette in the past:	
Yes	94 (18.0)
No	428 (82.0)
Age started smoking (years):	
Never	428 (82.0)
< 7	20 (3.8)
8-12	31 (5.9)
13-16	24 (4.6)
≥16	19 (3.6)
Number of cigarette smoked/ day:	
0	499 (95.6)
1-5	9 (1.7)
6-14	9 (1.7)
15-20	4 (0.8)
>20	1 (0.2)

Statistical analysis

SPSS version 19.0 was used for statistical analysis. Odds ratios for media exposure and perception of media use and effectiveness were calculated using bivariate and multivariate logistic regression models.

Results

The demographic characteristics of the medical students are presented in Table 1. Of 522 students who responded, slightly more males (n=17) than females (n=6) were current smokers, the majority of whom smoked off-campus (65.2%, n=15) (p<0.05). Females were less likely to have taken a puff of a cigarette than males (45.7% vs. 54.3%, respectively; p>0.05). However, more females than males had started smoking before age 7 (n=11 and 9 respectively), a difference that was not significant. There were also no significant gender differences in terms of marital status, year of study and race.

Table 2 shows the crude association between media exposure and gender. The volume of anti-smoking messages received during the last thirty days mostly fell within the "some" category, followed by the categories "a lot" and "never". Messages delivered through the internet were received least often. There was no significant gender difference in the number of messages received. Both males and females had been offered free cigarettes by tobacco

Table 2. Crude and Adjusted Association of Media Exposure by Gender

Factors	N (%)		Crude Analysis OR (95% CI)	Adjusted Analysis OR (95% CI)
	M	F		
The amount of anti-smoking message received within the last 30 days?				
a. Radio				
A lot	36 (28.3)	113 (28.6)	Ref	Ref
Some	67 (52.8)	207 (52.4)	1.0 (0.55-1.82)	0.36 (0.29-1.54)
Never	24 (18.9)	75 (19.0)	0.99 (0.58-1.69)	0.90 (0.29-2.82)
b. Printed materials				
A lot	43 (33.9)	149 (77.6)	Ref	Ref
Some	72 (56.7)	203 (51.4)	0.81 (0.53-1.25)	0.58 (0.27-1.24)
Never	12 (9.4)	43 (10.9)	1.03 (0.50-2.13)	1.13 (0.30-4.23)
c. Billboards				
A lot	44 (34.6)	142 (35.9)	Ref	Ref
Some	67 (52.8)	205 (51.9)	0.95 (0.61-1.47)	1.09 (0.51-2.34)
Never	16 (12.6)	48 (12.2)	0.93 (0.48-1.80)	1.23 (0.39-3.83)
d. TV				
A lot	50 (39.4)	148 (74.7)	Ref	Ref
Some	56 (44.1)	199 (37.5)	1.20 (0.78-1.86)	1.39 (0.65-2.98)
Never	21 (16.5)	48 (12.2)	0.77 (0.42-1.41)	0.49 (0.15-1.62)
e. Internet				
A lot	27 (21.3)	63 (15.9)	Ref	Ref
Some	50 (39.4)	170 (43.0)	1.46 (0.84-2.53)	1.50 (0.62-3.65)
Never	50 (39.4)	162 (41.0)	1.39 (0.80-2.41)	1.29 (0.51-3.32)
Owning items with tobacco companies logo				
A lot	3 (2.4)	8 (2.0)	Ref	Ref
Some	21 (16.5)	20 (5.1)	0.36 (0.08-1.54)	0.27 (0.35-2.12)
Never	103 (81.1)	367 (92.9)	1.34 (0.35-5.13)	1.09 (0.16-7.30)
Having received offers of free cigarette or incentives for smoking from tobacco companies?				
A lot	1 (0.8)	5 (1.3)	Ref	Ref
Some	8 (6.3)	10 (2.5)	0.25 (0.02-2.59)	0.76 (0.41-14.02)
Never	118 (92.9)	380 (96.2)	0.64 (0.08-5.57)	0.98 (0.07-13.38)

companies.

With regard to approaches to reducing cigarette use, only one was significantly different between genders after adjustment for sociodemographic characteristics and smoking history. Specifically, compared to male students, female students were more likely to agree with a total ban on cigarette use. There were few differences in the perceptions of other approaches, although a total ban on cigarette use and increasing the price of cigarettes received the least approval. Crude analyses of anti-smoking messages showed that male medical students were more likely than female medical students to perceive the print media and the internet as effective means of delivering anti-smoking messages. After adjusting for smoking status, there were no significant gender differences for the variables in table 2 and only one significant finding in table 3. Significantly, greater percentage of female students agreed on total ban of cigarette compared to male.

Discussion

This study identified a slight difference in male and female medical students' perceptions of the implementation of anti-smoking activities and the effectiveness of these activities in reducing the use of cigarettes in the general population. Regardless of their current smoking status, male medical students perceived that printed media and radio were the best methods for delivering anti-smoking messages. On the other hand, female students reported stronger approval of total bans on cigarette use than did male students.

Table 3. Crude and Adjusted of Ways to Reduce Cigarette Intake by Gender

Ways on How to Reduce Cigarette		N (%)		Crude Analysis OR (95% CI)	Adjusted Analysis OR (95% CI)
		M	F		
Total ban on the sales and use of cigarette	Highly agree	85 (66.9)	311 (78.7)	Ref	Ref
	Agree	25 (19.7)	74 (18.7)	0.81 (0.48- 1.35)	0.39 (0.18-0.86)*
	Fairly Agree	16 (12.6)	7 (1.8)	0.12 (0.05- 0.3)*	0.05 (0.01-0.22)*
	Disagree	0 (0.0)	3 (0.8)	NAD	NAD
	Strongly Disagree	1 (24.3)	0 (0.0)	NAD	NAD
Increasing the price of cigarette	Highly agree	95 (74.8)	293 (74.2)	Ref	Ref
	Agree	20 (15.7)	56 (14.2)	0.9 (0.52-1.59)	1.03 (0.44-2.39)
	Fairly Agree	7 (5.5)	33 (8.4)	1.53 (0.66-3.57)	2.34 (0.64-8.54)
	Disagree	3 (2.4)	6 (1.5)	0.65 (0.16-2.64)	1.50 (0.25-9.14)
	Strongly Disagree	2 (1.6)	7 (1.8)	1.14 (0.23-5.56)	4.55 (0.22-93.45)
Ban smoking at public places	Highly agree	112 (88.2)	359 (90.9)	Ref	Ref
	Agree	10 (7.9)	32 (8.1)	0.99 (0.48-2.10)	5.09 (0.99-26.02)
	Fairly Agree	3 (2.4)	4 (1.0)	0.41 (0.09-1.89)	2.64 (0.06-111.96)
	Disagree	2 (1.6)	0 (0.0)	NAD	NAD
	Strongly Disagree	0	0	NAD	NAD
Ban sales to < 16 years old	Highly agree	111 (87.4)	354 (89.6)	Ref	Ref
	Agree	10 (7.9)	28 (7.1)	0.88 (0.41-1.86)	0.59 (0.14-2.32)
	Fairly Agree	4 (3.1)	6 (1.5)	0.47 (0.13-1.86)	0.64 (0.08-5.35)
	Disagree	1 (0.8)	1 (0.3)	0.31 (0.02-5.05)	NAD
	Strongly Disagree	1 (0.8)	6 (1.5)	1.89 (0.22-15.79)	1.62 (0.17-15.48)
Ban smoking at workplaces	Highly agree	111 (87.4)	363 (76.6)	Ref	Ref
	Agree	10 (7.9)	31 (7.8)	0.95 (0.45-1.99)	0.50 (0.13-1.98)
	Fairly Agree	5 (3.9)	1 (16.7)	0.06 (0.01-0.53)	0.03 (0.01-1.23)
	Disagree	1 (0.8)	0 (0.0)	NAD	NAD
	Strongly Disagree	0 (0.0)	0 (0.0)	NAD	NAD
Conduct anti-smoking campaign	Highly agree	105 (82.7)	328 (83.0)	Ref	Ref
	Agree	14 (11.0)	55 (13.9)	1.26 (0.67-2.36)	2.13 (0.58-7.79)
	Fairly Agree	7 (5.5)	8 (2.0)	0.37 (0.13- 1.04)	0.77 (0.13-4.61)
	Disagree	0 (0.0)	1 (0.3)	NAD	NAD
	Strongly Disagree	1 (0.8)	3 (0.8)	NAD	NAD
Make anti-smoking compulsory in schools	Highly agree	108 (85.0)	351 (88.9)	Ref	Ref
	Agree	15 (11.8)	36 (9.1)	0.35 (0.39-1.40)	0.36 (0.10-1.26)
	Fairly Agree	4 (3.1)	8 (2.0)	0.62 (0.18-2.08)	1.49 (0.15-15.26)
	Disagree	0 (0.0)	0 (0.0)	NAD	NAD
	Strongly Disagree	0 (0.0)	0 (0.0)	NAD	NAD
The following anti-smoking messages are effective to refrain you from smoking					
A. Radio:	Highly agree	76 (59.8)	180 (45.6)	Ref	Ref
	Agree	18 (14.2)	99 (25.1)	2.32 (1.31-4.10)*	3.69 (0.99-13.68)
	Fairly Agree	23 (18.1)	83 (21.0)	1.52 (0.89-2.60)	2.27 (0.61-8.49)
	Disagree	5 (3.9)	23 (5.8)	1.94 (0.71-5.30)	1.79 (0.16-19.71)
	Strongly Disagree	5 (3.9)	10 (2.5)	0.84 (0.28-2.55)	NAD
B. Printed Media:	Highly agree	76 (59.8)	189 (36.2)	Ref	Ref
	Agree	24 (18.9)	115 (22.0)	1.93 (1.15-3.22)*	1.64 (0.31-8.62)
	Fairly Agree	18 (14.2)	65 (12.4)	1.45 (0.81-2.61)	2.24 (0.26-19.58)
	Disagree	4 (3.1)	15 (2.8)	1.51 (0.49-4.69)	NAD
	Strongly Disagree	5 (3.9)	11 (2.1)	0.89 (0.29-2.63)	NAD
C. Billboard:	Highly agree	112 (88.2)	359 (90.9)	Ref	Ref
	Agree	10 (23.8)	32 (8.1)	1.98 (1.17-3.33)	0.62 (0.12-3.17)
	Fairly Agree	3 (2.4)	4 (1.0)	1.33 (0.75-2.34)	1.25 (0.15-10.60)
	Disagree	2 (1.6)	0 (0.0)	2.41 (0.69-8.43)	NAD
	Strongly Disagree	0 (0.0)	0 (0.0)	0.72 (0.24-2.23)	NAD
D. TV	Highly agree	81 (63.8)	207 (52.4)	Ref	Ref
	Agree	21 (16.5)	123 (31.1)	2.29 (1.35-3.89)	1.00 (0.26-3.85)
	Fairly Agree	16 (12.6)	44 (11.1)	1.08 (0.58-2.02)	0.20 (0.03-1.44)
	Disagree	4 (3.1)	12 (3.0)	1.17 (0.37-3.75)	NAD
	Strongly Disagree	5 (3.9)	9 (2.3)	0.70 (0.23-2.16)	NAD
E. Internet (including video games)	Highly agree	78 (61.4)	190 (48.1)	Ref	Ref
	Agree	22 (17.3)	105 (26.6)	1.96 (1.15-3.33)*	1.46 (0.41-5.25)
	Fairly Agree	15 (11.8)	62 (15.7)	1.70 (0.91-3.16)	1.42 (0.26-7.94)
	Disagree	6 (4.7)	25 (6.3)	1.71 (0.68-4.33)	1.49 (0.19-11.53)
	Strongly Disagree	6 (4.7)	13 (3.3)	0.89 (0.33-2.42)	0.71 (0.03-15.91)

*P<0.01, **P<0.001, Controlled for all the socio demographic and smoking histories of the two groups

Our results indicate that television is the most common source of anti-smoking messages. This result is similar to a previous study showing that secondary students were most likely to recall anti-smoking messages delivered by television and radio (Flynn et al., 2010). Delivering messages by television is increasingly challenging given

that audiences, especially youth, are migrating to cable TV, which has fewer advertisements. Earlier studies did not show that exposure to anti-smoking messages on television and radio was associated with reductions in future smoking among older age groups (14-15 years), although these messages were very effective for those

aged less than 12-13 years old (Siegel and Biener, 2000).

Compared to radio and television, anti-smoking messages from internet sources were less common in our study. This finding is concerning because the internet is highly accessible and provides an easy and increasingly popular method of obtaining cigarettes and other tobacco products online. For example, in the US, YouTube receives 1.2 billion visits from 122 million people annually, and 26% of these people were less than 18 years old (Forsyth, 2012). Furthermore, researchers have recently found that more YouTube videos portray smoking in a positive way than in a negative way (Forsyth et al., 2012). Therefore, to ensure greater dissemination among young people, we urge local governments and international partnerships to promote the delivery of anti-smoking messages through Facebook, YouTube, online newspapers and online advertisements. This can be accomplished by introducing more health-promoting websites where young people can obtain information about their personal health concerns, including tobacco use and smoking cessation. These websites should be coupled with strict filtering programs that block tobacco advertisements on the internet.

There was little difference in media exposure between males and females. Because all of the medical students were staying in hostels and engrossed in their studies, their exposure to the external environment and interactions with individuals other than fellow medical students may have been limited. It is difficult to explain why male students deemed printed materials more effective than did female students. Compared to female students, male students may favour the visual effect of printed materials and auditory messages from the radio. The fact that listening to the radio can be performed while simultaneously reading and studying may play a role. Similarly, magazines and music are more appealing to older teenagers who listen to music on the radio or compact discs for an average of 20 hours a week, which exceeds the time they spend watching television (Brown and Witherspoon, 2002). These results may have important implications for targeting male adolescents and youth who are busy studying and working.

Our most alarming finding was the continuing negative influence of the tobacco companies, despite strict bans on direct and indirect tobacco advertisement in Malaysia (Assunta and Chapman, 2004a). The number of students who still own items with tobacco company logos and who continue to be offered free cigarettes illustrates this influence. Despite being taught about the harmful effects of tobacco in Medical School, some students disagreed or slightly agreed with a total ban of cigarettes. Disagreement with the total ban was more common among the male students. In this regard, we postulate that male medical students in particular retain a false perception of the harms of tobacco use. This false perception may be enhanced by the influence of medical specialists, lecturers and parents who are smokers (Smith and Leggat, 2007).

Furthermore, these students are future physicians. Their current false perception of tobacco could increase the chance that they will begin smoking during their working years, particularly when their clinical burden becomes very stressful and demanding. In addition, any slight influence tobacco companies have on medical

students, who are aware of the disadvantages of smoking, would suggest that tobacco companies might have a greater influence on non-medical university students. Future research should look into the differences in tobacco company influence between these two groups and how it affects their smoking habits.

Our results have implications for anti-smoking policies and campaigns in other countries. Overall, it will be quite difficult to convince the general public not to smoke if their physicians have a false perception of the harms of tobacco use and are themselves smokers or are not discouraging tobacco use. Secondly, our results may allow public health policy makers to ascertain how advanced the smoking epidemic is in their country and how soon smoking prevalence could decline. Third, we suggest that public health policy makers take the perception of the future doctors and youth leaders into account when attempting to improve anti-tobacco campaigns, especially when the campaigns target adolescents. Finally, medical school curriculums should place more emphasis on anti-smoking information, which is currently lacking in Malaysia.

These results should be interpreted in the context of several study limitations. First, our sample consisted of slightly more than half of the eligible medical students. Students who refused to answer could have been smokers who were concerned about their potential loss of anonymity. Second, the number of smokers in our sample was small, which limited our analysis of the association of current smoking with media influence. Finally, the data collected were by self-report and may be biased if the students discussed the questionnaire with each other while they were completing it.

Despite these limitations, our findings highlight the importance of addressing gender differences when planning media campaigns targeting young people. Future research should examine the underlying reasons for gender differences, and how the differences can be used to improve media-based tobacco prevention efforts and policy implementation.

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