

Cross-sectional survey: smoking among medical, pharmacy, dental and nursing students, University of Health Sciences, Lao PDR

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ABSTRACT

Objectives: To investigate the prevalence of and attitudes to smoking among third year medical, pharmacy, dentistry and nursing students in Lao People's Democratic Republic (PDR).

Design: A cross-sectional survey conducted among third year university level, health professional students. The survey used a self-administered questionnaire which was originally developed by WHO, and modified to suit the setting.

Setting: The setting was the University of Health Sciences in Vientiane, the capital of Lao PDR. Participants were recruited from the Faculties of Medicine, Pharmacy, Dentistry and Nursing. At the time of the survey, 521 third year students were enrolled.

Primary and secondary outcome measures: The primary outcome measure was prevalence of current cigarette smoking and other tobacco use. Smoking status was categorised as: current smoker, ex-smoker and non-smoker with current smokers defined as those who had smoked cigarettes or used other tobacco on one or more days during the previous 30 days.

Results: In total, 506 respondents completed the questionnaire, giving a response rate of 97.1% to 98.5% across the different faculties. Overall smoking prevalence was 5.07% (95% CI 3.2% to 7.1%), which is lower than previously reported national prevalence rates. Women reported smoking less than men did (OR=0.56, 95% CI=0.013 to 0.242; p=0.003). The majority of students supported tobacco control measures. The number of people who reported receiving formal training in tobacco cessation counselling ranged from 10.9% (95% CI 5.3% to 19.1%) among nursing students to 51.1% (95% CI 40.4% to 61.7%) among medical students.

Conclusions: Smoking prevalence among this cohort was relatively low. Students were supportive of tobacco control policies. Further research is needed to understand what is working in this context, in order to apply lessons learnt in similar settings. In the meantime, health professional students should be provided health education to discourage tobacco use. Information on tobacco control policies needs to be more widely disseminated.

ARTICLE SUMMARY

Article focus

- Investigates the prevalence of smoking and exposure to second-hand smoke among medical, pharmacy, dentistry and nursing students in their third year in the University of Health Sciences, Lao PDR.
- Investigates knowledge and attitudes about tobacco use and training received regarding patient counselling on smoking cessation techniques in this student cohort.

Key messages

- This is the first survey which investigates smoking prevalence and attitudes among health professional students in Lao PDR.
- Most students supported tobacco control measures, but formal training in tobacco cessation counselling was variable.
- Health education and skills building to provide effective counselling on quitting smoking to patients should be part of the curricula for health professional students in Lao PDR.

Strengths and limitations of this study

- The survey used a previously validated questionnaire and had a high response rate for each type of health professional (97.1% to 98.5%)
- Survey results cannot be extrapolated to practicing health professionals in Lao PDR or to allied health professionals.
- As a cross-sectional survey, causality cannot be tested.

INTRODUCTION

Tobacco is a leading cause of preventable mortality and morbidity in the majority of high-income countries, and it is becoming increasingly prevalent in low-income countries.¹ Almost 1 billion men and about 250 million women in the world are daily smokers; in particular, 35% and 50% of men and 22% and 9% of women in developed

and developing countries, respectively, smoke.² While cigarette consumption has been declining in high-income countries, it is rising in low-income and middle-income countries.³ By 2030, approximately 70% of deaths attributable to smoking worldwide are expected to occur in developing countries.¹ The negative health consequences of smoking are considerable and have been well-documented.⁴⁻⁵ In its preamble, the WHO Framework Convention on Tobacco Control (FCTC) emphasises the vital contribution of participation of health professional bodies, training and health-care institutions in tobacco control efforts.⁶ Health professionals who smoke also send an ambiguous message to patients whom they have encouraged to cease smoking.⁶⁻⁷

One of the strategies to reduce smoking-related morbidity and mortality is to encourage the involvement of health professionals in tobacco-use prevention and cessation counselling.⁸ Medical professionals who smoke are more likely to hold attitudes that prevent them from providing patients with antismoking advice.⁹ Thus, it is suggested that healthcare students be exposed to tobacco control policies and education from the outset of their training.¹⁰ As a consequence, there have been several studies which have collected information from health profession students in different contexts about their tobacco use.¹¹⁻¹² The prevalence of smoking among medical students has been found to vary widely from country to country. In a systematic review of the literature, Smith and Leggat⁸ concluded that the prevalence of smoking among male medical students ranged between 3% in the USA¹³ and 58% in Japan.⁷ Smith and Leggat⁸ also observed marked differences in smoking rates between males and females, with male students generally having higher rates. A cross-sectional study at Charité medical school in Berlin found that the prevalence of tobacco use was 22.1% among women and 32.4% among men in fifth year medical students studying occupational medicine.¹⁰ A cross-sectional study carried out at the Malta Medical School and the Institute of Health Care found that more than a quarter of health professional students were daily or occasional smokers.¹⁴ This was slightly higher than that found in the corresponding adult Maltese population of the same age.¹⁴ High levels of smoking prevalence have been reported among physicians in several low-middle income countries. In China, one study found that 58% of male and 19% of female physicians reported being current cigarette smokers.¹⁵

A national survey in the Lao People's Democratic Republic (PDR) in 2003 reported that 40.3% of the population was smokers. Males were over four times more likely females (67.7% vs 16%) to smoke.¹⁶ This large disparity by sex has also been reported in neighbouring countries,¹ and reflects gender norms that encourage male smoking and condone female smoking.¹⁷ A 2003 study of smoking prevalence in male doctors at Mahosot University Hospital in the

Lao capital, Vientiane, reported a smoking prevalence rate of 35%.¹⁸ A more recent national survey of the prevalence of current smoking among Lao doctors reported a prevalence rate of 9.3%.¹⁹ Studies have also shown that young people in Lao often start smoking at an earlier age than that which is typical for entry into tertiary education and medical schools.¹⁹ While there are some data available on smoking prevalence rates, data on the smoking habits of health professional students in Lao PDR are scarce.

In 2005, the WHO and the US Centre for Disease Control and Prevention developed and administered the Global Health Professions Student Survey (GHPSS) in 10 countries.⁶ The present study used GHPSS to assess the prevalence of smoking among third year dentistry, medicine, pharmacy and nursing university students. It also investigated attitudes towards smoking cessation policies and programmes and factors associated with smoking. The findings are important because this is the first such survey of health professional students in the Lao PDR that provides insight into the smoking prevalence and habits among these future health professionals.

METHODS

The present study followed the GHPSS standardised methodology including data processing procedures.

Study setting

The study setting was the University of Health Sciences, located in Vientiane Capital City, Lao PDR. The University consists of seven faculties: Medicine, Pharmacy, Dentistry, Nursing, Medical Technology, Basic Sciences and Postgraduate Studies and Research and is the only health university in the country. This study included students from the third years of Medicine, Pharmacy, Dentistry and Nursing. At the time of the study, the Faculty of Medical Technology was in the process of gaining approval for an undergraduate curriculum and offered only a higher Diploma, and thus did not have third year students. Similarly, the Faculty of Basic Sciences did not have third year students, and thus students from these two faculties were excluded from the study.

Participants and sampling

This cross-sectional GHPSS Survey was a medical school-based survey of third-year students in dentistry, medicine, nursing and pharmacy programmes. The sample size was calculated to be 482 (the proportion of smoking among health professional students was unknown, so we used 50%) with 95% CI and 5% precision. Inclusion criteria were all male and female third-year medical, dental, pharmacy and nursing students registered for the 2008/2009 academic session in the University of Health Sciences. A list of eligible students from the medical, dental, pharmacy and nursing faculties was

obtained from the office of Academic Affairs at the University of Health Sciences. This established that, at the time of data collection, the total number of enrolled third-year students across the four faculties was 521. Of these, 506 consented to participate.

Variables

The GHPS collects information on demographics, prevalence of cigarette smoking and other tobacco use, knowledge and attitudes about tobacco use, exposure to second-hand smoke, desire for smoking cessation and training received regarding patient counselling on smoking cessation techniques. The outcome variable was smoking status, classified into three categories: current smoker, ex-smoker and non-smoker. Current cigarette smokers were defined as those who had smoked cigarettes on one or more days during the previous 30 days. Those who had been smokers before, but had stopped smoking at the time of survey, were defined as ex-smokers/ever smoked. Those who had never smoked in his/her lifetime were defined as never smokers. The predictor variable was attitude towards smoking. This was measured by summation of scores on attitude items; each item was scored with one for each 'against smoking' and zero for 'favourable to smoking'. A maximum of 11 potential points was obtained if a respondent answered all attitude questions, and thus the possible score on the attitude scale ranged from 0 to 11. The other predictor variables were gender, age and receiving training on the danger of smoking. Table 1 provides the variables and definitions.

Data collection

The survey was conducted during May–June 2009. Prior to the survey, training was provided for the research supervisors and assistants. The English language

questionnaire was translated into Lao, back translation performed and followed by an independent third person checking the translation. The translated instrument was then pilot tested with second year medical students. Based on this, some of the wording was modified on the translated version, but these revisions did not change the intended meaning of the questions.

To minimise loss of sample size due to absenteeism, we administered the questionnaire on the day of an examination. To reduce the risk of response bias or students feeling pressured to stay, the teachers were asked to leave the classroom and it was emphasised that students were free to leave or not complete the questionnaire without any reprisals. The purpose of the study was explained and students given time to ask questions. Students who agreed to partake in the study were asked to remain behind to complete the questionnaire. The self-administered questionnaire took students 30–40 min to complete. After completing the questionnaires, the students left them on the tables for the instructors or research assistants to collect them.

Data analysis

The software package STATA V.10.1 was utilised for statistical analysis. Frequency distributions with mean and SD were used to describe respondents' demographic characteristics, smoking behaviours and other variables. After checking to ensure that the data did not violate assumptions, univariate analysis was carried out using χ^2 testing for categorical variables, with a p value of <0.05 being taken as the threshold for statistical significance. All results have a margin of error of $\pm 5\%$ (95% CI). Differences in rates for these indicators were considered statistically significant at the $p=0.05$ level. Logistic regression analysis was used for determining the factors associated with smoking among the health professional

Table 1 Definition of variables

| Variable | Definition |
|--|---|
| Current cigarette smoking | Students who smoked cigarettes on at least 1 day during the month preceding the survey |
| Ex-smoker/never smokers | Those who had been smokers before but had stopped smoking at the time of the survey were considered ex-smokers |
| Exposure to second-hand smoke (SHS) and supporting a ban on smoking in public places | <ul style="list-style-type: none"> ▶ Students who reported being exposed to SHS at home during the 7 days preceding the survey. ▶ Students who reported being exposed to SHS in public spaces during the 7 days preceding the survey ▶ Students who reported that they supported a ban on smoking in public places |
| Attitude and knowledge | Opinions of students towards smoking a cigarette, their knowledge on the harmful effects of smoking, and on the roles and responsibilities of health professionals |
| Tobacco education | Students who responded with 'yes' to having been taught about the dangers of smoking in the year preceding the survey |
| Tobacco lessons | Students who received formal training on cessation counselling and services during their medical training |

students by controlling for gender and age. We used the backward stepwise model by excluding the non-significant variables and retaining only the significant variables. Cases with missing data were excluded from the analysis.

Ethics

This research was approved by the research ethics committee of the University of Health Sciences, Lao PDR. The researchers in charge of the survey explained the objectives of the research to the students and emphasised that participation was voluntary. Care was taken to communicate information about the research accurately and in an understandable way to enable a genuine choice to be made. Nevertheless, given the classroom setting, it is possible that some respondents felt pressured to stay. Written consent was obtained from each respondent and anonymity assured.

RESULTS

In total, 506 respondents completed the questionnaire, giving a response rate of 97.1% to 98.5% across the different faculties. For each type of health professional, the response rate ranged from 97.1% to 98.5% (table 2). The high response rate minimised the risk of bias due to the population not being representative of the target population.

The majority of participants were male (59.5%, n=296 and missing, n = 7) and were aged between 19 and 24 years (78.1%, n=395 and missing, n=5).

Prevalence of smoking

The overall prevalence of current smoking among the third-year health professional students in this sample was 5.1% (missing, n=13). Prevalence was highest among dental students, with a rate of 7.9% (missing, n=1); the lowest current smoking prevalence was reported among pharmacy students (1.5%; missing, n=4). Of the respondents, 35.2% were ex-smokers (missing, n=17). Information about the prevalence of smoking in the present study is presented in table 3. Of the respondents who had ever smoked, 30.4% also reported having smoked other tobacco products such as chewing tobacco, snuff, beedis, cigars or pipes.

A χ^2 test for independence (with Yates continuity correction) indicated a significant association between gender and smoking status but with a very small effect size, $\chi^2 = (1, n=486) = 24, p < 0.001, \phi \leq -0.23$.

Attitudes towards tobacco control

Most of the respondents expressed positive attitudes towards tobacco control irrespective of their own smoking status. The mean score on the 11th attitude questions was 12.34 ± 1.45 with no significant difference between males and females or between smokers and non-smokers. The majority of students agreed, for example, that tobacco sales to adolescents should be banned and that smoking should be banned in public places including discos and bars. While non-smokers were more likely than smokers to agree that health professionals should be role models (98.3% vs 88%, $p=0.015$), both smokers and non-smokers strongly agreed that health professionals should give advice about quitting smoking (95.3% and 95.8, respectively). Respondents also agreed that health professionals have a role in giving advice to patients about smoking cessation (98.1%) and that such advice would enhance the possibility of someone quitting (92.2%). Further information about attitudes to tobacco control is found in table 4.

Knowledge of smoking policy and training

Just over half of the students (51.6%) reported being aware of the university's non-smoking policy within the school buildings and hospital grounds. Some (22.6%), however, thought the policy only applied to the school buildings, while 14.9% were unaware of the policy. There was no statistically significant difference between the responses of smokers and non-smokers in terms of knowledge of the policy (25% vs 22.3%, $p=0.814$). There was, however, a statistically significant difference between health professional programmes on awareness of smoking policy within the school buildings and hospitals, with dental students (59.4%) being more aware of the smoking policy compared to students from pharmacy (53.8%), medicine (52.2%) and nursing faculties (23.5%) ($p=0.002$). Of those who were aware of the smoking policy, 78.3% believed that the policy was enforced, while 6.8% disagreed with this view. There was no statistically significant difference between the responses of smokers and non-smokers regarding perceptions of the extent to which the non-smoking policy was enforced (79.2% vs 78.1%, $p=0.845$). Information about awareness of the smoking policy is presented in table 5.

The students who had received formal training in tobacco cessation counselling ranged from 10.9% among nursing students to 51.1% among medical

Table 2 Response rate of the participants from each programme

| Discipline | Dental | Medical | Nursing | Pharmacy | Total |
|---------------------------------------|--------|---------|---------|----------|-------|
| Students (n) | 65 | 285 | 35 | 136 | 521 |
| Respondents | 64 | 276 | 34 | 132 | 506 |
| Response rate (%) | 98.5 | 97.2 | 97.1 | 97.8 | 97.6 |
| Percentage of total sample population | 12.6 | 54.5 | 6.7 | 26.1 | 100 |

Table 3 Health professional students' response rate and smoking prevalence (95% CI)

| Categories | Dental (n=64) | Medical (n=276) | Nursing (n=34) | Pharmacy (n=132) | Total (n=506) |
|--|---------------------|---------------------|---------------------|---------------------|---------------------|
| Percentage of current smokers (95% CI) | 7.9 (7.1 to 8.8) | 6 (5.5 to 6.5) | 6.1 (4.8 to 7.7) | 1.5 (1.0 to 1.9) | 5.1 (3.2 to 7.1) |
| Missing (n) | 1 | 7 | 1 | 4 | 13 |
| Percentage never smokers | 55.6 (54.0 to 57.1) | 66.2 (65.1 to 67.2) | 76.5 (73.8 to 78.9) | 78.7 (77.6 to 80.0) | 68.8 (64.4 to 72.9) |
| Missing (n)= | 1 | 13 | 0 | 5 | 19 |
| % never smokers/ex-smokers | 44.4 (42.9 to 46.0) | 39.3 (38.2 to 40.3) | 26.5 (23.9 to 29.2) | 24.2 (23.0 to 25.6) | 35.2 (30.9 to 39.6) |
| Missing (n)= | 1 | 11 | 0 | 5 | 17 |

students. Medical students (51.1%) were significantly more likely than pharmacy students (25%) or dental students (13%) to have received such training but not significantly more likely than nursing students (10.9%) to have received training (data not shown). There was no statistically significant difference between smokers and non-smokers about what they recalled being taught in the tobacco cessation counselling training. Information related to the provision of tobacco education to respondents is shown in [table 6](#).

Factors associated with smoking

When asked about exposure to second hand smoke (SHS), 7.3% of respondents reported being exposed to SHS on each of the 7 days prior to the survey, with a significant difference between smokers and non-smokers. Smokers were more likely to have been exposed to SHS either within their home (unadjusted OR=3.25, 95% CI=1.4 to 7.7; $p=.007$) or outside the home environment (unadjusted OR=2.6, 95% CI=1.1 to 6.6; $p=0.046$) in the bivariate analysis. A multivariate analysis of factors related to current smoking among health professional students controlling for confounding factors of sex and age revealed a statistically significant difference between males and females and current smoking (OR=0.56, 95% CI=0.013 to 0.242; $p<0.001$). No significant difference was found, however, between age group, attitudes to smoking cessation and receiving training on the risks of smoking. Further, in the multivariate logistic regression, no statistically significant association was found between exposure to SHS and current smoking status. More information is provided in [table 7](#).

DISCUSSION

The aim of this study was to evaluate the University of Health Sciences, Lao PDR's professional health students' smoking habits, knowledge about smoking and attitudes towards smoking cessation counselling. Our study highlighted several important results including relatively low prevalence of smoking, positive attitudes towards tobacco control irrespective of own smoking status and a reasonable level of awareness of the university's non-smoking policy. The study indicated that exposure to SHS from within the household was a smoking predictor in the bivariate analysis. Other studies have highlighted the impact of this exposure.^{20 21} In our study, however, after controlling for confounding factors of sex and age in the multivariate analysis, the significance of exposure to SHS was lost with only gender being a predictor of current smoking.

Particularly noteworthy in the present study is that the prevalence of smoking is lower than previously reported national prevalence rates¹⁶ and lower than reported in a national survey of Lao medical doctors.¹⁹ Compared with the prevalence rates among health professionals from other countries including China,²² Italy²³ and Vietnam,²⁰ the students in this sample also demonstrate

Table 4 Attitudes towards tobacco control among health professional students, University of Health Sciences, Lao People's Democratic Republic (PDR)

| Respondents who answered yes to the question... | Total (n=493)* | Smokers (n=26) | Non-smokers (n=468) | p Value |
|--|----------------|----------------|---------------------|-------------|
| | Per cent (n) | Per cent (n) | Per cent (n) | (two-sided) |
| Should tobacco sales to adolescents be banned? | 94.9 (466) | 95.7 (22) | 94.9 (444) | 1.000 |
| Should advertising be completely banned? | 78.2 (383) | 65.2 (15) | 78.8 (368) | 0.127 |
| Do you agree with a smoking ban in restaurants? | 90.7 (447) | 80.0 (20) | 91.2 (427) | 0.072 |
| Do you agree with a smoking ban in discos/bars/pubs? | 70.5 (347) | 70.8 (17) | 70.5 (330) | 1.000 |
| Do you think that smoking in all public spaces should be banned? | 83.1 (409) | 72.0 (18) | 83.7 (391) | 0.165 |
| Should health professionals get cessation training? | 94.1 (463) | 92.0 (23) | 94.2 (440) | 0.652 |
| Are health professionals role models? | 97.8 (481) | 88.0 (22) | 98.3 (459) | 0.015 |
| Should health professionals give quitting advice routinely? | 95.3 (466) | 95.8 (23) | 95.3 (443) | 1.000 |
| Should health professionals routinely advise their patients who use other tobacco products to quit using these products? | 70.0 (345) | 72.0 (18) | 69.9 (327) | 1.000 |
| Do health professionals have a role in giving advice about smoking cessation to patients? | 98.0 (482) | 96.0 (24) | 98.1 (458) | 0.409 |
| Do chances of quitting improve if a health professional gives advice? | 92.4 (451) | 95.8 (23) | 92.2 (428) | 1.000 |

*The total sample size for each question is not the same due to missing values.

a lower smoking rate. Also of note were the overall positive attitudes to smoking control expressed by both smokers and non-smokers. Respondents generally endorsed tobacco control training, including counselling, and agreed that in the curricula health professionals can play an important role in assisting smokers cease smoking. This reflects other recent findings in Lao PDR.¹⁹ Despite these positive attitudes, knowledge of the university's no-smoking policy, which has been in existence since 2007, and its perceived enforcement was variable. Given that the benefits of smoking restrictions as a component of comprehensive tobacco control programmes has been well documented, information about the non-smoking regulations needs to be more widely disseminated.

The literature encourages the inclusion of information on tobacco control and counselling in the undergraduate

curricula of future health professionals.²⁴ It has been found, for example, that healthcare providers who receive formal smoking cessation training are more likely to intervene with patients who use tobacco than those who are not formally trained.^{25 26} Research suggests that simple advice from doctors or nurses during routine care primary care, hospital wards, outpatient clinics and industrial clinics can significantly increase smoking cessation rates.^{27 28} The number of people in the present study who reported receiving formal training in tobacco cessation counselling varied substantially, ranging from 10.9% among nursing students to 51.1% among medical students. Nevertheless, the overall smoking rates were low, suggesting the need for further research, including qualitative research to understand what is working in this context and if lessons learnt could be applied to other similar contexts. In the meantime, given that provision of

Table 5 Awareness of smoking policy by programme

| | Dental (n=64, %) | Medical (n=276, %) | Nursing (n=34, %) | Pharmacy (n=132, %) | Total (N=506, %) |
|---|------------------|--------------------|-------------------|---------------------|------------------|
| Does your school have an official policy banning smoking in school buildings and clinics? | | | | | |
| Yes, for school buildings only | 25.0 | 17.9 | 44.1 | 25.8 | 22.6 |
| Yes, for clinics only | 1.6 | 3.3 | 8.8 | 1.5 | 3.0 |
| Yes, for school buildings and clinics | 59.4 | 52.2 | 23.5 | 53.8 | 51.6 |
| No official policy | 14.1 | 26.6 | 23.5 | 18.9 | 22.8 |
| Is your school's official smoking ban for school buildings and clinics enforced? | | | | | |
| Yes, policy is enforced | 82.8 | 75.9 | 69.7 | 83.2 | 78.3 |
| No, policy is not enforced | 9.4 | 5.5 | 12.1 | 6.9 | 6.8 |
| School has no official policy | 7.8 | 18.6 | 18.2 | 9.9 | 14.9 |

Table 6 Provision of tobacco education to health professional students, University of Health Sciences, Lao PDR

| Respondents who answered yes to the question... | Total (n=493)* Per cent (n) | Smokers (n=26) Per cent (n) | Non-smokers (n=468) Per cent (n) | p Value (two-sided) |
|---|-----------------------------------|-----------------------------------|--|------------------------|
| During classes, were you taught about the dangers of smoking? | 77.0 (359) | 80.0 (20) | 77.0 (359) | 1.000 |
| During classes, were you taught about the reasons why people smoke? | 62.8 (309) | 56.0 (14) | 63.2 (295) | 0.526 |
| Did you learn that it is important to record tobacco use history? | 35.7 (176) | 32.0 (8) | 35.9 (168) | 0.831 |
| Have you ever received formal training in smoking cessation? | 18.2 (88) | 32.0 (8) | 17.5 (80) | 0.104 |
| Did you learn that it is important to provide educational quitting materials? | 38.0 (186) | 41.7 (10) | 37.8 (176) | 0.830 |
| Have you ever heard of nicotine replacement therapies? | 37.1 (182) | 44.0 (11) | 36.7 (171) | 0.525 |
| Have you heard of antidepressant use in cessation programmes? | 24.3 (118) | 37.5 (9) | 23.6 (109) | 0.143 |

PDR, People's Democratic Republic.

*The total sample size for each question is not the same due to missing values.

formal education is an important strategy in promoting cessation,²⁶ more emphasis should be given on providing knowledge and counselling skills to all health professional students at the University in Vientiane. This should include training on tobacco control advocacy programmes²² and smoking cessation skills.²⁹ A study in Lao PDR found that policymakers were supportive of integration of antismoking lessons in the training curricula,³⁰ and this study underscores the need to explore effective ways of doing this.

As with all research, our study does have some limitations. First, the GHPS respondents in this survey are third-year health professional students who have not had substantial interaction with patients, and therefore the survey results should not be extrapolated to account for practicing health professionals in Lao PDR. Second, our study included only the health professionals represented at the University of Health Sciences and thus excluded

some of the allied health professionals who provide front-line services. Further, as a cross-sectional survey, causality cannot be tested. Finally, as a self-administered questionnaire, students may not always have provided accurate responses.³¹

CONCLUSION

This study contributes to our knowledge of tobacco use among health professionals in Lao PDR. It is the first study to our knowledge which has investigated smoking prevalence and attitudes within health professional students in Lao PDR. It suggests that smoking prevalence among this cohort is low and that these health professional students are supportive of tobacco control policies. Further qualitative research is needed to understand what is working and why in this context in order to apply lessons learnt in similar settings.

Table 7 Factors associated with current smoking among health professional students, University of Health Sciences, Lao PDR

| | N | Per cent | Adjusted OR | 95% CI | p Value |
|--|----|------------|-------------|----------------|---------|
| Sex | | | | | <0.001 |
| Male | 22 | 11.5 | 1 | 0.013 to 0.242 | |
| Female | 3 | 1.0 | 0.056 | | |
| Age | | | | | 0.628 |
| ≤24 years | 20 | 4.9 | 1 | 0.203 to 2.615 | |
| ≥25 years | 4 | 5.2 | 0.729 | | |
| Attitudes towards smoking (X+SD) | 23 | 12.69+1.55 | 1.147 | 0.855 to 1.513 | 0.377 |
| Receiving training on the dangers of smoking | | | | | 0.713 |
| No | 5 | 4.5 | 1 | | |
| Yes | 20 | 5.3 | 0.806 | 0.255 to 2.545 | |
| Exposure to SES in the home during the past 7 days | | | | | 0.084 |
| No | 8 | 2.7 | 1 | 0.96 to 1.86 | |
| Yes | 17 | 8.4 | 1.34 | | |

PDR, People's Democratic Republic; SES, socio-economic status.

Contributors SV developed the research proposal, translated the instrument, and collected the data in the field sites, as well as analysed and wrote the manuscript. MC and SN contributed to the study design, collected the data and commented on the manuscript. VH and KC assisted in the collection of data, analysed the data and contributed to the final version of the manuscript. JD contributed to the analysis, interpretation and preparation of the manuscript. All authors read and approved the final version of the manuscript.

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REFERENCES

- World Health Organization. *WHO Report on the Global Tobacco Epidemic, 2009: implementing smoke-free environments*. Geneva: World Health Organization, 2009.
- Mackay J, Eriksen M. *The tobacco atlas*. Geneva: World Health Organization, 2002.
- Sotiropoulos A, Gikas A, Spanou E, *et al*. Smoking habits and associated factors among Greek physicians. *Public Health* 2007;121:333–40.
- Anthonisen NR, Skeans MA, Wise RA, *et al*. The effects of a smoking cessation intervention on 14.5-year mortality: a randomized clinical trial. *Ann Intern Med* 2005;142:233–9.
- Peto R, Darby S, Deo H, *et al*. Smoking, smoking cessation, and lung cancer in the UK since 1950: combination of national statistics with two case-control studies. *BMJ* 2000;321:323–9.
- The GTSS Collaborative Group. Tobacco use and cessation counselling: Global Health Professionals Survey Pilot Study, 10 countries. *Tob Control* 2006;15(Suppl II):ii31–4.
- Kawane H. Antismoking education for medical students. *Chest* 1992;101:1480.
- Smith D, Leggat P. An international review of tobacco smoking among medical students. *J Postgrad Med* 2007;53:55–62.
- Cummings KM, Giovino G, Sciandra R, *et al*. Physician advice to quit smoking: who gets it and who doesn't. *Am J Prev Med* 1987;3:69–75.
- Kusma B, Quarcoo D, Vitzthum K, *et al*. Berlin's medical students' smoking habits, knowledge about smoking and attitudes toward smoking cessation counseling. *J Occup Med Toxicol* 2010;5:9.
- Naskar NN, Bhattacharya SK. A study on drug abuse among the undergraduate medical students in Calcutta. *J Indian Med Assoc* 1999;97:20–1.
- Ljubicica D, Schneiderb NK, Vrazic H. Attitudes and knowledge of third year medical students in Croatia about tobacco control strategies: results of the Global Health Professionals Pilot Survey in Croatia. *Public Health* 2008;122:1339–42.
- Mangus RS, Hawkins CE, Miller MJ. Tobacco and alcohol use among 1996 medical school graduates. *JAMA* 1998;280:1192–3,5.
- Cauchi D, Mamo J. Smoking health professional student: an attitudinal challenge for health promotion? *Int J Environ Res Public Health* 2012;9:2550–61.
- Li HZ, Sun W, Cheng F, *et al*. Cigarette smoking status and smoking cessation counseling of Chinese physicians in Wuhan, Hubei Province Asia Pacific. *J Public Health* 2008;20:183–92.
- Ministry of Health & National Institute of Public Health. *Lao World Health Survey 2004*. Vientiane Ministry of Health and National Institute of Public Health, 2006.
- World Health Organization. *Gender, health and tobacco*. Geneva: Department of Gender and Women's Health, World Health Organization, 2003.
- Tomson T, Boupha K, Gilljam H, *et al*. Knowledge, attitudes and smoking behavior among Lao doctors. *Southeast Asian J Trop Med Public Health* 2003;34:213–19.
- Sychareun V, Morrow M, Phengsavanh A, *et al*. Smoking among Lao medical doctors: challenges and opportunities for tobacco control. *Tob Control* 2011;20:144–50.
- Huy NV, An DTM, Phong DN. Smoking among Vietnamese medical students: prevalence, costs, and predictors. *Asia Pac J Public Health* 2008;20:16–24.
- Singh MCVV, Singh CZ, Banerjee A, *et al*. Determinants of smoking habit among medical students. *Med J Armed Forces India* 2003;59:209–11.
- Yang T, Abdullah AS, Rockett IRea. Assessment of tobacco control advocacy behavioral capacity among students at schools of public health in China. *Tob Control* 2011;20:20–5.
- Gualano MR, Bontempi C, Saule R, *et al*. Validation of the global health professions students survey questionnaire in Italy. *Ital J Public Health* 2011;8:392–8.
- FDI/World Health Organization. Tobacco or oral health: an advocacy guide for oral health professionals. In: Beaglehole RH, Benzian HM, eds. *FDI World Dental Federation*. Ferney Voltaire, France. Lowestoft: World Dental Press, 2005.
- Lancaster T, Stead L, Silagy C, *et al*. Effectiveness of interventions to help people stop smoking: findings from the Cochrane library. *BMJ* 2000;321:355–8.
- Emmons KM. Smoking cessation and tobacco control: an overview. *Chest* 1999;116:490S–2S.
- Stead LF, Bergson G, Lancaster T. Physician advice for smoking cessation. *Cochrane Database Syst Rev* 2008;2:CD000165.
- Rice VH, Stead LF. Nursing interventions for smoking cessation. *Cochrane Database Syst Rev* 2008;1:CD001188. doi: 10.1002/14651858.CD001188.pub3.
- McLead D, Somasundaram R, Dowell AC. Promotion of smoking cessation by New Zealand general practitioners: a description of current practice. *N Z Med J* 2000;24:480–2.
- Sychareun V, Phengsavanh A, Hansana V, *et al*. Health policymakers' knowledge and opinions of physicians smoking and tobacco policy control in Lao PDR. *BMC Public Health* 2012;12:816.
- Gorber SC, Schofield-Hurwitz S, Hardt J, *et al*. The accuracy of self-reported smoking: a systematic review of the relationship between self-reported and cotinine-assessed smoking status. *Nicotine Tob Res* 2009;11:12–24.