

## Tobacco Control Law awareness, enforcement, and compliance among high school students in Myanmar

Nyi Nyi Latt<sup>1,2</sup>, Yu Mon Saw<sup>1,3</sup>, Su Myat Cho<sup>1</sup>, Tetsuyoshi Kariya<sup>1</sup>, Eiko Yamamoto<sup>1</sup>, and Nobuyuki Hamajima<sup>1</sup>

<sup>1</sup>Department of Healthcare Administration, Nagoya University Graduate School of Medicine, Nagoya, Japan

<sup>2</sup>Aung Myin Myint Mo Hospital, Gyobingauk, Myanmar

<sup>3</sup>Nagoya University Asian Satellite Campuses Institute, Nagoya, Japan

### ABSTRACT

In Myanmar, the Control of Smoking and Consumption of Tobacco Products Law (Tobacco Control Law; TCL), which covers the prohibition of sale of tobacco to minors and all forms of tobacco advertisement, was enacted in 2006. This study aimed to examine the awareness of the TCL among high school students. A cross-sectional study was conducted in November 2015. Participants were 1,339 high school students (554 boys and 785 girls) from two regions and two states of Myanmar. Data were collected using anonymous self-administered questionnaires and revealed that 78.0% of boys and 86.5% of girls responded the sale of tobacco products in or within 100 feet from school, and 83.4% of boys had ever seen someone selling tobacco products to minors. More than half of the students had ever seen minors selling or distributing tobacco products, and had knowledge about the TCL, while only 9.7% knew about the penalties. The adjusted odds ratio (95% confidence interval) of awareness of the TCL was 2.12 (1.35–3.31) for students who had ever received tobacco products free of charge, or seen/heard about their distribution free of charge, 1.86 (1.20–2.89) for current smokeless tobacco users, and 0.58 (0.43–0.77) for students who had ever seen someone selling tobacco products to minors. The majority of high school students did not know that the violation of the TCL could be punished with a fine and/or imprisonment. These findings suggest that awareness of the TCL was very low among high school students, highlighting that TCL enforcement and compliance, and tobacco-related health education programs are not satisfactory in Myanmar.

Keywords: Tobacco Control Law, high school students, advertisement, tobacco, Myanmar

This is an Open Access article distributed under the Creative Commons Attribution-NonCommercial-NoDerivatives 4.0 International License. To view the details of this license, please visit (<http://creativecommons.org/licenses/by-nc-nd/4.0/>).

### INTRODUCTION

Tobacco utilization is one of the major preventable causes of death and disability worldwide. Tobacco use kills more than seven million people each year,<sup>1)</sup> having caused 100 million deaths in the 20th century. If the current trend continues, it may cause one billion deaths in the 21st century. In the next two decades, the annual death toll from tobacco use is expected to rise to over 8 million, with more than 80% of those deaths projected to occur in low and middle-income

---

Received: December 15, 2017; accepted: March 1, 2018

Corresponding Author: Yu Mon Saw, PhD

Department of Healthcare Administration, Nagoya University Graduate School of Medicine, 65 Tsurumai-cho, Showa-ku, Nagoya 466-8550, Japan

E-mail: sawyumon@med.nagoya-u.ac.jp

countries. The United Nations' Sustainable Development Goals of target number 3.4 is to reduce premature mortality from non-communicable diseases by one-third by 2030 through prevention and treatment.<sup>2)</sup> However, monitoring tobacco use and prevention policies are an area neither sufficiently prioritized nor adequately funded by nations.<sup>3)</sup>

To address the global burden of tobacco use, the World Health Assembly in 2003 unanimously adopted the World Health Organization Framework Convention on Tobacco Control (WHO FCTC). According to the homepage of WHO FCTC, as of October 19, 2017, Mozambique became the 181<sup>st</sup> party of the WHO FCTC on July 14, 2017.<sup>4)</sup> Myanmar became a signatory to the WHO FCTC on October 23, 2003, and ratified it on April 20, 2004, becoming the 11<sup>th</sup> party. To increase tobacco control measures in Myanmar, the Control of Smoking and Consumption of Tobacco Products Law, State Peace and Development Council Law No. 5/2006 (Tobacco Control Law; TCL) was enacted on May 4, 2006, and has been effective since May 4, 2007.<sup>5)</sup> However, rules have been made to date, and tobacco industries and many individuals are violating the TCL in different ways. Therefore, the TCL enforcement measures have not been adequately implemented in Myanmar for a decade.

Enforcing tobacco use regulations among minors and monitoring the prevalence of smoking among young adults is especially important, and there were several reports examining the contents of regulations and their effectiveness.<sup>6-10)</sup> The percentage of smokers among students have also been reported in many countries.<sup>11-14)</sup> In Myanmar, the Global Youth Tobacco Survey (GYTS) 2016 found that 17.0% of boys and 1.5% of girls aged 13–15 years were smokers who were enrolled in 9–11th grade.<sup>15)</sup> Among 400 medical students, 12.8% were smokers.<sup>16)</sup> Smokeless tobacco use estimated by several surveys including the GYTS was 9.8% among school children aged 13–15 years and 20.8% among adults.<sup>17)</sup>

The TCL was enacted more than a decade ago. However, the tobacco control measures as well as law enforcement seem questionable. The present survey was conducted to evaluate the awareness and perception of high school students regarding the tobacco control legislation and examine the enforcement of and compliance with the TCL in Myanmar, highlighting the areas to be strengthened for effective law enforcement. The survey findings are expected to raise alarm over the stagnant tobacco control interventions in the country, which would be useful to encourage stakeholders to take the necessary actions to make the Myanmar population healthier. Moreover, we hope that the findings from this study will highlight the need for better tobacco control measures not only in Myanmar, but also in other countries.

## MATERIALS AND METHODS

### *Study participants*

Myanmar is formed of seven states, seven regions, and one union territory. In these, 3,511 high schools and 840,771 high school students were registered in 2015–2016. Firstly, two states (Shan and Mon) and two regions (Bago and Magway) were selected using simple random sampling with a drawing method. Subsequently, two high schools from each state/region were selected with the same method. One high school in Magway region could not participate in the study because of local religious affairs. Thus, this cross-sectional study was carried out in seven high schools using an anonymous self-administered questionnaire in November 2015. Participants were students in grades 10 and 11 who attended school on the day of the survey. The number of eligible participants at each school as well as the location and name of the high schools were not recorded. In total, 1,339 students (554 boys and 785 girls) participated in this study.

### *Study questionnaire*

The study questionnaire was newly developed by the researchers through reviews of the TCL in Myanmar and past studies including the WHO GYTS. The questionnaire was pre-tested with 230 high school students at Gyobingauk Township, Bago Region, and the pre-test results were used to finalize the questionnaire. The self-administered questionnaire included 1) background information, 2) experience with tobacco products, 3) exposure to second-hand smoking, 4) perception of smoking and smokeless tobacco products, 5) sale of tobacco, 6) health warnings and information, and 7) tobacco advertisement, promotion, and sponsorship.

### *Statistical analysis*

The collected data were analyzed using the Statistical Package for Social Science (SPSS) software program version 24.0 (IBM SPSS Inc.). Chi-square tests were used for hypothesis testing of categorical data. Multiple logistic regression analysis was performed to estimate the odds ratio (OR) and 95% confidence interval (CI) of TCL awareness. In total, 21 independent variables with two categories were used for the multiple analysis; 1) age (< 14 years and > 14 years), 2) sex, 3) grade, 4) current smoking status, 5) current smokeless tobacco use, 6) parents smoking status, 7) sibling smoking status, 8) passive smoking at home, 9) ever received health education, 10) availabilities of tobacco products in school or within 100 feet, 11) ever seen someone selling tobacco products to minors, 12) ever seen minors selling or distributing tobacco products, 13) ever seen someone selling single cigarettes or any package with less than 20 cigarettes, 14) ever seen about the tobacco advertisement signboards, 15) ever seen about the tobacco advertisement of drawing or painting, 16) ever seen about the tobacco advertisement of description in journals, magazines, newspapers and pamphlets, 17) ever seen about the tobacco advertisement of broadcasting, 18) ever heard about the tobacco advertisement of announcement at fairs and festivals, 19) ever seen or heard about the tobacco advertisement of sponsorship or support to sports, funfairs, exhibitions, or any social activities, 20) ever seen or heard about the distribution of tobacco products free of charge or as a present, and 21) ever received tobacco products free of charge or as a present. The independent variables were selected in a forward method, compulsory including “age”, “sex”, and “current smoker.”

### *Ethical considerations*

This study was approved by the Department of Medical Services, Ministry of Health, Myanmar (Letter no. 617 of Planning/Research issued on August 26, 2015) and Ministry of Education, Myanmar (Letter no. 12125 of Information/Research issued on October 19, 2015), as well as the ethical review committee of Nagoya University School of Medicine (No. 6518 issued on August 31, 2015). The aims of the study and questionnaire contents were explained to local educational steering committees and authorities, high school authorities, and teachers to obtain permission to conduct the survey at schools. After obtaining permission, the study objectives and questionnaire contents were explained to high school students before requesting them to complete the questionnaires. The dataset was anonymous from the first stage of data handling.

## RESULTS

In total, 1,339 high school students (554 boys and 785 girls) from seven high schools completed questionnaires. Since school information was not included in the questionnaire, the data could not be analyzed according to school. The number of students who declined participating was also not recorded to prevent the comparison of participation rates between the schools.

**Table 1** Characteristics of study participants according to gender

Characteristics	Boys (N=554)		Girls (N=785)		Total (N=1,339)	
	N	%	N	%	N	%
<b>Age</b>						
≤ 14 years	215	38.8	344	43.8	559	41.7
15 years	236	42.6	335	42.7	571	42.6
16 years	76	13.7	98	12.5	174	13.0
17 years	21	3.8	8	1.0	29	2.2
≥ 18 years	6	1.1	0	0.0	6	0.4
<b>Grade</b>						
10	378	68.2	519	66.1	897	67.0
11	176	31.8	266	33.9	442	33.0
<b>Current smoker</b>						
No	492	88.8	777	99.0	1,269	94.8
Yes	62	11.2	8	1.0	70	5.2
<b>Current smokeless tobacco user</b>						
No	433	78.2	779	99.2	1,212	90.5
Yes	121	21.8	6	0.8	127	9.5
<b>Passive smoking at home</b>						
No	458	82.7	652	83.1	1,110	82.9
Yes	96	17.3	133	16.9	229	17.1
<b>Father smoking</b>						
No	522	94.2	750	95.5	1,272	95.0
Yes	32	5.8	35	4.5	67	5.0
<b>Mother smoking</b>						
No	552	99.6	782	99.6	1,334	99.6
Yes	2	0.4	3	0.4	5	0.4
<b>Sibling smoking</b>						
No	494	89.2	729	92.9	1,223	91.3
Yes	60	10.8	56	7.1	116	8.7
<b>Other family members smoking</b>						
No	545	98.4	746	95.0	1,291	96.4
Yes	9	1.6	39	5.0	48	3.6

Table 1 shows the characteristics of participants according to gender. Of the 1,339 high school students, 81.4% of boys and 86.5% of girls were aged 15 years or younger at the time of the survey. Of all participants, 11.2% of boys and 1.0% of girls were current smokers, while 21.8% of boys and 0.8% of girls were current smokeless tobacco users. Among boys, 17.3% had experienced passive smoking at home, and 5.8% had fathers and 10.8% siblings who were current smokers.

Results regarding recognition of tobacco sales among high school students are shown in Table 2. It was found that 78.0% of boys and 86.5% of girls recognized the sale of tobacco products in or within 100 feet from school, and 83.4% of boys had ever seen someone selling tobacco products to minors. More than half (57.4% of boys and 56.3% of girls) had ever seen minors

**Table 2** Awareness of tobacco sales among high school students in Myanmar

Tobacco sale	Boys (N=554)		Girls (N=785)		Total (N=1,339)	
	N	%	N	%	N	%
<b>Tobacco products selling in or within 100 feet from school</b>						
No	122	22.0	106	13.5	228	17.0
Yes	432	78.0	679	86.5	1,111	83.0
<b>Ever seen someone selling tobacco products to minors</b>						
No	92	16.6	162	20.6	254	19.0
Yes	462	83.4	623	79.4	1,085	81.0
<b>Ever seen minors selling or distributing tobacco products</b>						
No	236	42.6	343	43.7	579	43.2
Yes	318	57.4	442	56.3	760	56.8
<b>Ever seen someone selling single cigarettes or any package with less than 20 cigarettes</b>						
No	57	10.3	108	13.8	165	12.3
Yes	497	89.7	677	86.2	1,174	87.7

selling or distributing tobacco products, and 89.7% of boys and 86.2% of girls reported that they had ever seen someone selling single cigarettes or any package with less than 20 cigarettes.

Table 3 presents the recognition of tobacco advertisement stratified by gender. In total, 75.8% of boys and 69.0% of girls had seen tobacco advertisements more than once a week. Furthermore, 12.6% of boys and 9.2% of girls reported noticing the drawings or paintings of tobacco advertisement on vehicles, walls, and boards. More than one-third of both boys and girls reported that they had ever seen or heard about tobacco advertisement sponsoring or supporting sports, funfairs, exhibitions, or social activities. Similarly, 35.9% of boys and 32.9% of girls had ever received tobacco products free of charge or as a present, or seen/heard about their distribution free of charge or as a present.

Table 4 illustrates the knowledge about tobacco product regulations among the high school students. More than half of the boys (59.6%) and girls (55.7%) had ever heard about the TCL, while 89.0% of boys and 91.2% of girls did not know that violating this law could be punished with a fine and/or imprisonment. No students had ever heard about any actions taken or reporting upon any violation of this law.

Table 5 shows the unadjusted OR (UOR) and adjusted OR (AOR) and 95% CI of answering “yes” to the question “Have you ever heard about the Control of Smoking and Consumption of Tobacco Products Law?”. The UOR (95% CI) of a positive answer was 1.29 (1.03–1.60) for students older than 14 years, 1.79 (1.06–3.02) for current smokers, and 1.92 (1.29–2.87) for current smokeless tobacco users, while it was 0.70 (0.53–0.93) for students who had ever seen someone selling tobacco products to minors. Using a forward method, six significant questions other than age, gender, and current smoking were selected as shown in Table 5. The AOR (95% CI) was higher than 2 for students who had ever seen drawings or paintings of tobacco advertisements (on vehicles, on walls, on boards, etc.), and for those who had received tobacco products free of charge or as a present, or seen/heard about their distribution free of charge or as a present. An AOR under 1 was found for those who had ever seen someone selling tobacco products to minors and those who had ever received health education.

**Table 3** Awareness of tobacco advertisement among high school students in Myanmar

Variables	Boys (N=554)		Girls (N=785)		Total (N=1,339)	
	N	%	N	%	N	%
<b>Had seen or heard about the tobacco advertisement in any form</b>						
> Once a week	420	75.8	542	69.0	962	71.8
≤ Once a week	134	24.2	243	31.0	377	28.2
<b>Ever seen about the tobacco advertisement signboards (vinyl, LED, stickers, etc.)</b>						
No	529	95.5	757	96.4	1,286	96.0
Yes	25	4.5	28	3.6	53	4.0
<b>Ever seen about the tobacco advertisement of drawing or painting (on vehicles, on walls, on boards, etc.)</b>						
No	484	87.4	713	90.8	1,197	89.4
Yes	70	12.6	72	9.2	142	10.6
<b>Ever seen about the tobacco advertisement of description in journals, magazines, newspapers, and pamphlets</b>						
No	526	94.6	754	96.1	1,280	95.6
Yes	28	5.1	31	3.9	59	4.4
<b>Ever seen about the tobacco advertisement of broadcasting (TV, radio, internet, social network like Facebook, etc.)</b>						
No	512	92.4	740	94.3	1,252	93.5
Yes	42	7.6	45	5.7	87	6.5
<b>Ever heard about the tobacco advertisement of announcement at fairs and festivals</b>						
No	547	98.7	784	99.9	1,331	99.4
Yes	7	1.3	1	0.1	8	0.6
<b>Ever seen or heard about the tobacco advertisement of sponsorship or support to sports, funfairs, exhibitions, or any social activities</b>						
No	349	63.0	499	63.6	848	63.3
Yes	205	37.0	286	36.4	491	36.7
<b>Ever seen or heard about the distribution of tobacco products free of charge or as a present</b>						
No	510	92.1	727	92.6	1,237	92.4
Yes	44	7.9	58	7.4	102	7.6
<b>Ever received tobacco products free of charge or as a present, or seen/heard the distribution of them free of charge or as a present</b>						
No	355	64.1	527	67.1	882	65.9
Yes	199	35.9	258	32.9	457	34.1

**Table 4** Knowledge on tobacco product regulations among high school students in Myanmar

Tobacco sale	Boys (N=554)		Girls (N=785)		Total (N=1,339)	
	N	%	N	%	N	%
<b>Ever heard about “The Control of Smoking and Consumption of Tobacco Products Law”</b>						
No	224	40.4	348	44.3	572	42.7
Yes	330	59.6	437	55.7	767	57.3
<b>Violation can be punished with a fine and/or with imprisonment</b>						
No	493	89.0	716	91.2	1,209	90.3
Yes	61	11.0	69	8.8	130	9.7
<b>Agree that someone who violates the law shall be punished</b>						
No	86	15.5	123	15.7	209	15.6
Yes	468	84.5	662	84.3	1,130	84.4
<b>Ever heard about actions taken or reporting upon any violation of law</b>						
No	554	100.0	785	100.0	1,339	100.0
Yes	0	0.0	0	0.0	0	0.0

## DISCUSSION

To the best of our knowledge, this was the first study to report on the tobacco control measures among high school students in Myanmar. The results revealed that students who had ever seen drawings or paintings of tobacco advertisements (on vehicles, walls, boards, etc.) and those who had ever received tobacco products free of charge or as a present or seen/heard about their distribution free of charge or as a present, were twice more likely to know about the TCL than those who had not. Current smokeless tobacco users were more likely to know about the law compared to non-users. Conversely, students who had ever seen someone selling tobacco products to minors, and those who had ever received health education related to tobacco were less likely to know about TCL.

In this study, more than two-thirds of high school students recognized the sale of tobacco products on or within 100 feet from their school premises, and 83.4% of boys had ever seen someone selling tobacco products to minors. Young people are very vulnerable and easy to persuade to start something new that seems to be fashionable to them,<sup>17)</sup> and this kind of curiosity may lead them to try tobacco (both smoking and smokeless tobacco).<sup>18)</sup> The tobacco smoking rate has been increasing among the Myanmar youth, especially among females, showing the highest smoking rate among countries in the Association of Southeast Asian Nations.<sup>19,20)</sup> This finding highlights the weak enforcement of the TCL despite having been enacted in 2006.<sup>5)</sup> School authorities and parents need to take control of the situation, and local administrative officials must monitor sellers and take the necessary actions to ensure that they follow the law.

The present survey showed that current smokeless tobacco users were more likely to know about the law compared to non-users. Thus, awareness of the TCL might not prevent initiation of smoking and smokeless tobacco use. This finding was in line with a study with Palestine university students, which also reported that smokers had a better knowledge of anti-smoking laws.<sup>20)</sup> More importantly, 89.0% of boys and 91.2% of girls in the present study did not know that the violation of the TCL could be punished with a fine and/or imprisonment. Moreover, no students in this study reported having ever heard about any actions taken or reporting upon any violation of the TCL. Notwithstanding, the enforcement of the law is one of the key elements to prevent the initiation of smoking and smokeless tobacco use among young people.<sup>6-8,18)</sup>

**Table 5** Odds ratio (OR) and 95% confidence interval (CI) of answering “yes” to the question on TCL<sup>a)</sup> for characteristics of high school students in Myanmar

Characteristics	Having knowledge (N= 767)		Unadjusted		Adjusted <sup>b)</sup>	
	Yes	%	OR	95% CI	OR	95% CI
<b>Age</b>						
≤ 14 years	300	53.7	1	Reference	1	Reference
> 14 years	467	59.9	1.29	(1.03–1.60)*	1.23	(0.97–1.55)
<b>Sex</b>						
Boys	330	59.6	1	Reference	1	Reference
Girls	437	55.7	0.85	(0.68–1.06)	1.07	(0.84–1.37)
<b>Current smoker</b>						
No	718	56.6	1	Reference	1	Reference
Yes	49	70.0	1.79	(1.06–3.02)*	1.60	(0.92–2.80)
<b>Current smokeless tobacco user</b>						
No	667	55.9	1	Reference	1	Reference
Yes	90	70.9	1.92	(1.29–2.87)***	1.86	(1.20–2.89)**
<b>Ever received health education</b>						
No	324	60.4	1	Reference	1	Reference
Yes	443	55.2	0.81	(0.65–1.01)	0.75	(0.60–0.95)*
<b>Ever see someone selling tobacco products to minors</b>						
No	163	64.2	1	Reference	1	Reference
Yes	604	55.7	0.70	(0.53–0.93)**	0.58	(0.43–0.77)***
<b>Ever seen about the tobacco advertisement of drawing or painting (on vehicles, on walls, on boards, etc.)</b>						
No	669	55.9	1	Reference	1	Reference
Yes	98	69.0	1.76	(1.21–2.55)**	2.01	(1.37–2.95)***
<b>Ever seen about the tobacco advertisement of broadcasting (TV, radio, internet, social network like Facebook, etc.)</b>						
No	709	56.6	1	Reference	1	Reference
Yes	58	66.7	1.53	(0.97–2.43)	1.66	(1.03–2.67)*
<b>Ever received tobacco products free of charge or as a present, or seen/heard the distribution of them free of charge or as a present</b>						
No	696	56.3	1	Reference	1	Reference
Yes	71	69.6	1.78	(1.15–2.76)**	2.12	(1.35–3.31)***

\*P<0.05, \*\*P<0.01, \*\*\*P<0.001; <sup>a)</sup> Ever heard about TCL: “The Control of Smoking and Consumption of Tobacco Products Law” <sup>b)</sup> Adjusted for the variables listed in this table



Tobacco control is the most important measure to reduce mortality from non-communicable diseases.<sup>21-23</sup> However, tobacco advertisements are presented to the population in many ways, as these are not well controlled in Myanmar.<sup>19</sup> In our study, 75.8% of boys and 69.0% of girls in high schools had seen tobacco advertisements more than once a week. Exposure to media advertisement was associated with smoking among girls in Botswana.<sup>24</sup> Tobacco advertisement activities have continued using different forms and channels in Myanmar, which may lead to smoking initiation among young people.

The students who had ever seen drawings or paintings of tobacco advertisement (on vehicles, walls, boards, etc.) and those who had ever received tobacco products free of charge or as a present or seen/heard about their distribution free of charge or as a present were twice more likely to be aware of the TCL. A study in the United States reported that youth curiosity was related to different forms of tobacco advertising.<sup>25</sup> It was also shown in the present study that knowing about the TCL was not sufficient to prevent smoking initiation, as students could still be exposed to tobacco advertisements through different channels. A Chinese study revealed that middle school students had positive attitudes towards tobacco use, exposure to tobacco advertisement, and promotion programs.<sup>26</sup> Myanmar policy makers need to consider the current tobacco advertisement forms in Myanmar and prevent them from awakening students' curiosity towards tobacco and smokeless tobacco products, which can lead to the initiation of smoking and smokeless tobacco use.

Tobacco industries seek loopholes in the tobacco control measures, especially in developing countries like Myanmar. Students and children can afford to buy cigarettes because they are sold singly or in a package containing less than 20 across the whole country. In total, 89.7% of boys and 86.2% of girls reported having ever seen someone selling single cigarettes or any package with less than 20 cigarettes, although Myanmar TCL specifically prohibits this.<sup>5</sup>

Most tobacco companies distribute tobacco products and personal goods with the tobacco label free of charge or as a present, and some use brand stretching. Our findings showed that 35.9% of boys and 32.9% of girls had ever received personal goods with the label of tobacco products free of charge or as a present or had seen/heard about this happening. This exposure to tobacco brand names may increase students' curiosity towards tobacco and smokeless tobacco products. Myanmar government needs to reconsider and improve the current tobacco promotion and marketing restrictions in Myanmar.

Another interesting finding in our study was that students who had ever received health education related to tobacco were less likely to be aware of the TCL. This may be because tobacco-related health education focuses on adverse health outcomes of tobacco use. Future tobacco-related health education programs should cover the TCL and its enforcement in order to enhance the awareness of students.

There are some limitations to this study. Firstly, although a relatively large number of participants were randomly sampled, the participation rate was not measured. Since the schools wanted to avoid being linked with the results of survey, school names were not collected. The second limitation concerns the use of self-administered questionnaire, although self-reported measures are commonly used.

## CONCLUSION

Awareness of the TCL was very low among high school students in Myanmar. In addition, the majority of high school students did not know that violations of this law could be punished with a fine and/or imprisonment. Furthermore, no students in this study reported having ever heard about

any actions taken or reporting upon any violation of the TCL, highlighting that just knowledge and awareness of the law might not prevent initiation of smoking and smokeless tobacco use. This study indicated that TCL enforcement and compliance, as well as tobacco-related health education programs, are not satisfactory in Myanmar. Urgent legal measures must be considered as priority tasks to reduce smoking and smokeless tobacco use among youth.

### ACKNOWLEDGMENTS

The authors would like to thank the Ministry of Health and Sports, and Ministry of Education of Myanmar, the local authorities in the survey areas, and the staff at all participating schools. We would also like to thank all the high school students who voluntarily participated in this study.

### COMPETING INTERESTS

The authors declare that no competing interests exist.

### REFERENCES

- 1) World Health Organization. WHO Report on the Global Tobacco Epidemic 2017. 2017, World Health Organization, Geneva, Switzerland.
- 2) United Nations Resolution A/RES/70/1 of 25 September 2015. United Nations Official. Document. Available from: [http://www.un.org/en/development/desa/population/migration/generalassembly/docs/globalcompact/A\\_RES\\_70\\_1\\_E.pdf](http://www.un.org/en/development/desa/population/migration/generalassembly/docs/globalcompact/A_RES_70_1_E.pdf) (Accessed on December 5, 2017)
- 3) World Health Organization. Global Status Report on Non-communicable Diseases 2010, 2011, World Health Organization, Geneva, Switzerland.
- 4) World Health Organization. Framework Convention on Tobacco Control (WHO FCTC), 17 July 2017, World Health Organization, Geneva, Switzerland. Available from: <http://www.who.int/fctc/mediacentre/news/2017/congratulations-to-mozambique-new-party/en/> (Accessed on December 5, 2017)
- 5) Ministry of Health. Brief Profile on Tabaco Control in Myanmar. 2009, Ministry of Health, Nay Pyi Taw, Myanmar.
- 6) Forster JL, Komro KA, Wolfson M. Survey of city ordinances and local enforcement regarding commercial availability of tobacco to minors in Minnesota, United States. *Tob Control*, 1996; 5: 46–51.
- 7) DiFranza JR, Rigotti NA. Impediments to the enforcement of youth access laws. *Tob Control*, 1999; 9: 152–155.
- 8) Ohmi H, Hirooka K, Hata A, Mochizuki Y. The centenary of the enactment of the law for prohibiting minors from smoking in Japan. *Tob Control*, 2000; 9: 258–260.
- 9) Bonsal R, John S, Ling PM. Cigarette advertising in Mumbai, India: targeting different socioeconomic groups, women, and youth. *Tob Control*, 2005; 14: 201–206.
- 10) Li L, Yong H-H, Borland R, Fong GT, Thompson ME, Jiang Y, *et al.* Reported awareness of tobacco advertising and promotion in China compared to Thailand, Australia and the USA. *Tob Control*, 2009; 18: 222–227.
- 11) Takeuchi Y, Morita E, Naito M, Hamajima N. Smoking rates and attitudes to smoking among medical students: a 2009 survey at the Nagoya University School of Medicine. *Nagoya J Med Sci*, 2010; 72: 151–159.
- 12) Sinha DN, Rinchen S, Palipudi KM, Naing Shein NN, de Silva P, Khadka BB, *et al.* Tobacco use, exposure to second-hand smoke, and cessation training among the third-year medical and dental students in selected Member States of South-East Asia region: a trend analysis on data from the Global Health Professions Student Survey, 2005–2011. *Indian J Cancer*, 2012; 49: 379–386.
- 13) Alvur TM, Cinar N, Oncel S, Akduran F, Dede C. Trends in smoking among university students between

- 2005–2012 in Sakarya, Turkey. *Asian Pac J Cancer Prev*, 2014; 15: 4575–4581.
- 14) Backhaus I, D'Egidio V, Grassucci D, Gelardini M, Ardizzone C, La Torre G. Link between perceived smoking behaviour at school and students smoking status: a large survey among Italian adolescents. *Public Health*, 2017; 151: 169–176.
  - 15) Tun NA, Chittin T, Agarwal N, New ML, Thaug Y, Phyo PP. Tobacco use among young adolescents in Myanmar: Findings from global youth tobacco survey. *Indian J Public Health*, 2017; 61 (Supplement): S54–S59.
  - 16) Htay SS, Oo M, Yoshida Y, Harun-Or-Rashid M, Sakamoto J. Risk behaviours and associated factors among medical students and community youths in Myanmar. *Nagoya J Med Sci*, 2010; 72: 71–81.
  - 17) Akl EA, Jawad M, Lam WY, Co CN, Obeid R, Irani J. Motives, beliefs and attitudes towards waterpipe tobacco smoking: a systematic review. *Harm Reduct J*, 2013; 10: 12.
  - 18) Kyaing NN, Sein T, Sein AA, Than Htiike MM, Tun A, Shein NN. Smokeless tobacco use in Myanmar. *Indian J Cancer*, 2012; 49: 347–351.
  - 19) Tan YL, Dorotheo U. The Tobacco Control Atlas: ASEAN Region, Third Edition, 2016. Southeast Asia Tobacco Control Alliance (SEATCA), Bangkok, Thailand.
  - 20) Shoma RTA, Lubbad IK, Ansari WE, Al-khatib IA, Alharazin HJ. Smoking, awareness of smoking-associated health risks, and knowledge of national tobacco legislation in Gaza, Palestine. *Cent Eur J Public Health*, 2014; 22: 80–89.
  - 21) Magnusson RS, Patterson D. The role of law and governance reform in the global response to non-communicable diseases. *Global Health*, 2014; 10: 44.
  - 22) World Health Organization. Global Status Report on Noncommunicable Diseases. 2011, World Health Organization, Geneva, Switzerland.
  - 23) Beaglehole R, Bonita R, Horton R, Adams C, Alleyne G, Asaria P, *et al*. Priority actions for the non-communicable disease crisis. *Lancet*, 2011; 377: 1438–1447.
  - 24) Mbongwe B, Tapera R, Phaladze N, Lord A, Zetola NM. Predictors of smoking among primary and secondary school students in Botswana. *PLoS One*, 2017; 12: e0175640.
  - 25) Portnoy DB, Wu CC, Tworek C, Chen J, Borek N. Youth curiosity about cigarettes, smokeless tobacco, and cigars: prevalence and associations with advertising. *Am J Prev Med*, 2014; 47: 76–86.
  - 26) Xiao L, Yang J, Zhao L, Jiang Y, Chen X. Exposure to tobacco advertisement and promotion programs among Chinese middle school students: a cross-sectional survey. *Zhonghua Liu Xing Bing Xue Za Zhi*, 2015; 36: 309–313.