นิพนธ์ต้นฉบับ **Original Article**

การสำรวจการบริโภคยาสูบในเยาวชนไทย พ.ศ. 2565 เพื่อพัฒนานโยบายควบคุมยาสูบของประเทศไทย

Global youth tobacco survey 2022 for developing tobacco control policies in Thailand

ชยนันท์ สิทธิบุศย์[1]
ศรัณญา เบญจกุล[2]
อรณิชา หนูนาค[1]
รัฐชญา ตองติรัมย์[3]
ชัยวัฒน์ นาแหลม[1]
ธันยพร สกุลสวัสดิ์[1]
ทวีคูณ ผลาผล[4]
[1]*กองงานคณะกรรมการควบคุมผลิตภัณฑ์ยาสูบ กรมควบคุมโรค*
[2]*คณะสาธารณสุขศาสตร์ มหาวิทยาลัยมหิดล*
[3]*สถาบันป้องกันควบคุมโรคเขตเมือง กรมควบคุมโรค*
[4]*กองการแพทย์ทางเลือก กรมการแพทย์แผนไทยและการแพทย์ทางเลือก*

Chayanan Sittibusaya[1]
Sarunya Benjakul[2]
Onnicha Noonak[1]
Ruthchaya Tongtiram[3]
Chaiwat Nalaem[1]
Tanyaporn Sakulsawat[1]
Thaweekhun Palaphon[4]
[1]*Office of Tobacco Products Control Committee, Department of Disease Control*
[2]*Faculty of Public Health, Mahidol University*
[3]*Institute for Urban Disease Control, Department of Disease Control*
[4]*Divistion of Complementary and Alternative Medicine, Department of Thai Traditional and Alternative Medicine*

DOI: 10.14456/dcj.2025.28
Received: April 7, 2025 | **Revised:** June 4, 2025 | **Accepted:** June 10, 2025

บทคัดย่อ

การศึกษานี้มีวัตถุประสงค์เพื่อติดตามสถานการณ์เกี่ยวกับพฤติกรรมการบริโภคผลิตภัณฑ์ยาสูบของเยาวชนที่มีอายุ 13-15 ปี ของประเทศไทย โดยประชากรเป้าหมาย เป็นนักเรียนที่มีอายุ 13-15 ปี ในโรงเรียนสังกัดสำนักงานคณะกรรมการการศึกษาขั้นพื้นฐาน และสำนักงานคณะกรรมการส่งเสริมการศึกษาเอกชน จำนวน 6,752 คน ผลการสำรวจพบว่า นักเรียนใช้ผลิตภัณฑ์ยาสูบทุกชนิด (ได้แก่ บุหรี่ซิกาแรต ซิการ์ และยาเส้น) เป็นประจำ ร้อยละ 12.5 ใช้บุหรี่ซิกาแรต ร้อยละ 8.1 ทั้งนี้พบว่าปัจจุบันมีนักเรียนร้อยละ 17.6 สูบบุหรี่ไฟฟ้าเป็นประจำ พบการสัมผัสควันบุหรี่ที่บ้าน ร้อยละ 26.0 ที่โรงเรียน ร้อยละ 45.6 ในช่วง 30 วันที่ผ่านมานักเรียนเคยเห็นการโฆษณาหรือการส่งเสริมการขายบุหรี่ซองหรือผลิตภัณฑ์ยาสูบอื่น ๆ บนอินเทอร์เน็ต ร้อยละ 31.7 เคยเห็นโฆษณาส่งเสริมการขายบุหรี่ไฟฟ้า บนสื่อสังคมออนไลน์ ร้อยละ 48.0 และเห็นการส่งเสริมการขายผลิตภัณฑ์ยาสูบ ณ จุดขาย ร้อยละ 25.6 ทั้งนี้ ยังพบอีกว่านักเรียนเคยได้รับบุหรี่หรือผลิตภัณฑ์ยาสูบฟรีจากตัวแทนจำหน่ายบุหรี่ ร้อยละ 11.1 จากผลการ

สำรวจสะท้อนให้เห็นถึงสถานการณ์การสูบบุหรี่ไฟฟ้าของนักเรียน เพิ่มขึ้นจากปี พ.ศ. 2558 ถึง 5.3 เท่า โดยเพิ่มขึ้นจากร้อยละ 3.3 เป็นร้อยละ 17.6 กลยุทธ์ทางการตลาดของอุตสาหกรรมยาสูบ โดยเฉพาะโฆษณาในช่องทางออนไลน์ มุ่งเน้นกลุ่มเด็กและเยาวชนมากขึ้น และค่านิยมในการใช้ชีวิตและทัศนคติเชิงลบต่อการสูบบุหรี่ของเด็กและเยาวชนเปลี่ยนแปลงไป ประเทศไทยจำเป็นต้องมีการดำเนินมาตรการการป้องกันและควบคุมการแพร่ระบาดบุหรี่ไฟฟ้าในประเทศ เพื่อให้เกิดการควบคุมการแพร่ระบาดของบุหรี่ไฟฟ้าอย่างจริงจัง และยกระดับขึ้นเป็นการดำเนินงานระดับชาติจึงได้มีการจัดทำมาตรการการป้องกัน และควบคุมการแพร่ระบาดบุหรี่ไฟฟ้าในประเทศไทย โดยมีวัตถุประสงค์ป้องกันและควบคุมการแพร่ระบาดบุหรี่ไฟฟ้าในกลุ่มเด็กและเยาวชน

ติดต่อผู้นิพนธ์ : ชยนันท์ สิทธิบุศย์ อีเมล : doctor_oh@hotmail.com

Abstract

This study aimed to monitor the situation regarding tobacco product consumption behaviors among Thai youths aged 13 to 15 years. The target population consisted of 6,752 students aged 13 to 15 years, enrolled in schools under the Office of the Basic Education Commission and the Office of the Private Education Commission. The study found that 12.5% of the students regularly used all types of tobacco products (such as cigarette, cigars, and smokeless tobacco); 8.1% use cigarettes. It was found that currently, 17.6% of students smoked e-cigarettes regularly. Exposure to second-hand smoke at home was reported by 26.0% and at school by 45.6%. In the past 30 days, 31.7% of students noticed advertisements or promotions for cigarette packs or other tobacco products on the internet, 48.0% noticed e-cigarette advertisements on social media, and 25.6% reported having seen tobacco product promotions at points of sale. Additionally, 11.1% of students reported receipt of free cigarettes or tobacco products from cigarette distributors. The survey results reflect a significant increase in e-cigarette use among students, rising 5.3 times from 3.3% in 2015 to 17.6% in 2022. Marketing strategies of the tobacco industry, particularly online advertising, have increasingly targeted children and adolescents. Moreover, lifestyle values and attitudes of youth toward smoking have shifted. Thailand urgently needs to implement preventive and control measures to curb the spread of e-cigarettes in the country. To address this issue seriously and elevate it to a national agenda, a set of preventive and control measures for e-cigarette use in Thailand has been developed to curb the spread of e-cigarette use among children and adolescents.

Correspondence: Chayanan Sittibusaya Email: doctor_oh@hotmail.com

คำสำคัญ	**Keywords**
การสูบบุหรี่, การสำรวจการบริโภคยาสูบในเยาวชน, ประเทศไทย	*cigarette smoking, global youth tobacco survey, Thailand*

Introduction

The Global Youth Tobacco Survey (GYTS) is a survey on tobacco product consumption among students aged 13 to 15. Its purpose is to monitor tobacco use among youth in each country. The GYTS is also part of the Global Tobacco Surveillance Sys-

tem (GTSS), an international standard system. The data on youth tobacco consumption obtained from the survey serves as a foundational resource for developing tobacco control policies in line with the MPOWER strategy developed by the World Health Organization to reduce tobacco consumption[1].

The World Health Organization reported data on students aged 13-15 worldwide that at least 37 million, or 9.7%, use tobacco products. Among them, 12.5% are male students and 6.8% are female students[2]. Although cigarette smoking tends to decline in some countries, the use of electronic cigarettes has continuously increased in many countries, especially in Europe and North America[3]. In Thailand, a tobacco consumption survey was conducted among students aged 13-15 as part of the Global Youth Tobacco Survey (GYTS) project, which began in 2005 and concluded with the most recent survey in 2022. The results from the past three surveys show that in 2005, the prevalence of tobacco consumption among students aged 13-15 years was 15.7[4]. The second survey in 2009 found that the prevalence of tobacco use among students was 17.9%[5]. The results of the most recent survey in 2015 found that the prevalence of tobacco product use was 15.0%[6]. In addition to surveying the prevalence of tobacco product use, studies on the risk among students who have never smoked found that 16.4% of this group are likely to start smoking in the future. Several factors are associated with this risk, including being male, having friends who smoke, exposure to secondhand smoke in public places, seeing cigarette advertisements through online media, the belief that smoking helps reduce stress, and receiving insufficient information or participation in anti-smoking campaigns from schools or public media. This data highlights the necessity of strengthening youth's mental and behavioral immunity through education, positive communication, and the involvement of families, schools, and society to prevent smoking initiation and sustainably reduce tobacco use among young people[7].

This study aimed to monitor the tobacco consumption situation among students aged 13-15, as well as factors related to youth tobacco use, such as new forms of tobacco products, exposure to advertising and promotional activities, smoking cessation, secondhand smoke exposure, knowledge about tobacco products, and attitudes toward tobacco use. The data obtained from this survey will serve as crucial information for driving efforts to prevent the emergence of new smokers. It will also be used to develop effective systems and mechanisms for monitoring the tobacco consumption situation among Thai youth, including local-level data collection to serve as a foundational database for advancing tobacco control policies and strategies.

Materials and Methods

Sample and procedure

This survey was a cross-sectional descriptive study conducted between September and December 2022. The target population consisted of students aged 13 to 15 years from schools under the Office of the Basic Education Commission and the Office of the Private Education Commission, specifically schools with a population of no less than 40 students. The total target population nationwide was 1,968,916 individuals.

School selection was carried out using sample design parameters that targeted lower secondary schools (Grades 7-9) with either equal probability

sampling or probability proportional to school size. There were 20 schools selected from each region (Central, Northeast, North, South, and Bangkok), totaling 100 schools. Classrooms within selected schools were then systematically sampled, taking into account the probability of selection, using a simple random sampling method. All students in the selected classrooms were required to complete the questionnaire. The sample size was calculated using the methodology provided by the U.S. Centers for Disease Control and Prevention (CDC). Overall, 64.4% of the schools agreed to participate in the project.

Overall Response

Out of the 100 schools initially selected for the study, 87 agreed to participate, reflecting a high response rate and a strong commitment to the research. Similarly, 337 out of the 360 sampled classes participated in the data collection, demonstrating a high level of cooperation at the classroom level. In total, 6,752 students aged between 13-15 years were included in the core target group for analysis.

Research instrument

The questionnaire was developed for surveys conducted in countries participating in the project. It consisted of 47 core questions, 24 additional optional questions, and 7 questions tailored to the context of Thailand, totaling 78 questions. All participating countries in the GYTS survey used the same questions to ensure that the results on tobacco consumption among youth could be used for comparison across countries. The survey used a self-administered questionnaire, where respondents selected answers based on their own experiences. The questionnaire was divided into nine sections: personal information, tobacco product use among students, attitudes toward quitting smoking, exposure to second-hand smoke, access to tobacco products, knowledge about tobacco products from various media, exposure to tobacco product advertisements and promotions, students' attitudes or beliefs about e-cigarette use, and the use of flavored cigarettes and/or e-cigarettes.

Researchers adapted the questionnaire by performing a content validity check and language assessment for appropriateness review by experts. Based on their recommendations, the content was revised, and the Content Validity Index (CVI) was analyzed. The item-level content validity (I-CVI) ranged from 0.6 to 1.0. The scale-level content validity (S-CVI) across all nine sections of the questionnaire was 0.7, 0.8, 0.9, 0.8, 0.9, 0.8, 0.9, and 1.0

Analyze

The information for each student reflected the possibility of random sampling of all students. It aimed to reduce conflicts among students who do not respond to the questionnaire with the following weighting formula:

W = W1 * W2 * f1 * f2 * f3 * f4

W = Weighted Average

W1 = Probability of selecting each school

W2 = Probability of selecting each classroom in the selected school

f1 = At the school level, adjustment for schools that do not participate in the survey, calculated based on the number of students, divided into small, medium, and large sizes

f2 = At the classroom level, adjustment for classrooms that do not participate, calculated for each school

f3 = At the student level, adjustment for students who do not participate, calculated for each classroom

f4 = Stratified adjustment, calculated based on gender and grade level

The data collection was conducted by the researchers and subsequently submitted to the Centers for Disease Control and Prevention (CDC) for national and regional data weighting. The core questionnaire items were analyzed using the SUDAAN statistical software(8). The data were analyzed using descriptive statistics; frequency, mean ($\bar{X}$), and standard deviation (SD), and the 95% confidence interval (CI) was used to calculate the prevalence estimates in the population and the standard error (SE) of the forecast. Differences in the prevalence estimates were considered statistically significant if the 95% confidence intervals did not overlap.

IRB/IACUC Approval

The Global Youth Tobacco Survey 2022 received ethical approval from the Human Research Ethics Committee of the Department of Medical Sciences, Ministry of Public Health (Protocol No. 9/2565) on June 17, 2022.

Results

1. Personal Information

The study found that 38.4% of the students were 13 years old (95% CI: 36.1-40.9), 37.6% were 14 years old (95% CI: 35.9-39.3), and 24.0% were 15 years old (95% CI: 21.7-26.5). In terms of gender, 49.6% of the participants were male (95% CI: 47.1-52.1), while 50.4% were female (95% CI: 47.9-52.9). Regarding educational level, the majority of students were in Grade 8, accounting for 38.2% (95% CI: 35.3-41.3), followed by Grade 9 at 36.0% (95% CI: 32.8-39.4), and Grade 7 at 25.7% (95% CI: 23.0-28.7). Most students reported receiving a daily allowance from their parents, with 33.0% (95% CI: 30.3-35.8) receiving 100 Baht or less per day.

2. The prevalence of tobacco product use

The study revealed that the prevalence of tobacco product use (such as cigarettes, cigars, amd smokeless tobacco) among students aged 13-15 years was 12.5% (95% CI: 10.2-15.2). When analyzed by gender, male students exhibited a higher prevalence at 17.3% (95% CI: 13.8-21.4), compared to female students at 7.9% (95% CI: 6.6-9.4). Among these students, 11.4% (95% CI: 9.4-13.7) were identified as current smokers. The prevalence of regular cigarette smoking was found to be 8.1% (95% CI: 6.6-9.8). Additionally, 6.3% (95%CI: 5.0 -7.8) regularly used other smoked tobacco products, while 3.2% (95% CI: 2.1-4.8) regularly used smokeless tobacco products. The prevalence of regular electronic cigarette (e-cigarette) use was reported at 17.6% (95% CI: 15.1-20.3), with male students at 20.2% (95% CI: 16.4-24.6) and female students at 15.0% (95% CI: 12.9-17.4). Despite these findings, 19.1% of the students (95% CI: 17.5-20.7) reported that they would not use tobacco products in the future (Table 1).

3. Exposure to second-hand smoke

The study found that 26.0% of the students (95% CI: 23.8-28.3) were exposed to cigarette smoke in their homes. Additionally, 32.4% (95% CI: 30.3-34.5) were exposed inside public buildings, and 30.7% (95% CI: 28.2-33.2) were exposed outside public buildings. Moreover, 45.6% of the students (95% CI: 42.5-48.8) reported having see people smoking either inside or outside school buildings (Table 1).

Table 1 Prevalence of tobacco product use and second-hand smoke exposure among students aged 13-15 years

Topics	Prevalence (%) (95% CI) (n)		
	Total	Male	Female
Tobacco Product Use			
Current tobacco users	12.5 (10.2-15.2) (6,750)	17.3 (13.8-21.4) (2,957)	7.9 (6.6-9.4) (3,792)
Ever tobacco users	27.6 (24.7-30.8) (6,751)	35.8 (31.6-40.4) (2,958)	19.6 (17.6-21.7) (3,792)
Current tobacco smokers	11.4 (9.4-13.7) (6,748)	15.6 (12.5-19.1) (2,955)	7.3 (6.1-8.8) (3,792)
Ever tobacco smokers	26.4 (23.6-29.4) (6,749)	34.3 (30.1-38.6) (2,957)	18.7 (16.9-20.7) (3,791)
Current cigarette smokers	8.1 (6.6-9.8) (6,691)	11.4 (8.9-14.5) (2,922)	4.8 (4.0-5.8) (3,768)
Ever cigarette smokers	23.0 (20.5-25.7) (6,601)	30.4 (26.5-34.6) (2,853)	15.9 (14.3-17.6) (3,746)
Current smokers of other tobacco	6.3 (5.0-7.8) (6,711)	8.1 (6.4-10.4) (2,936)	4.5 (3.5-5.7) (3,774)
Ever smokers of other tobacco	11.7 (9.9-13.8) (6,711)	15.0 (12.5-18.0) (2,937)	8.5 (7.2-9.9) (3,773)
Current smokeless tobacco users	3.2 (2.1-4.8) (6,692)	4.7 (3.0-7.3) (2,930)	1.7 (1.1-2.5) (3,761)
Ever smokeless tobacco users	4.9 (3.5-7.0) (6,694)	7.2 (4.9-10.5) (2,929)	2.7 (1.9 - 3.7) (3,764)
Current electronic cigarette users	17.6 (15.1-20.3) (6,714)	20.2 (16.4-24.6) (2,933)	15.0 (12.9-17.4) (3,780)
Ever electronic cigarette users	37.3 (33.8-40.9) (6,708)	41.4 (37.2-45.7) (2,931)	33.2 (29.3-37.3) (3,776)
Exposure to second-hand smoke			
Exposed to tobacco smoke at home	26.0 (23.8-28.3) (6,744)	25.8 (23.0-28.9) (2,954)	26.1 (23.4-29.1) (3,789)
Exposed to tobacco smoke inside any enclosed public place	32.4 (30.3-34.5) (6,749)	30.9 (28.5-33.4) (2,957)	33.9 (30.4-37.6) (3,799)
Exposed to tobacco smoke at any outdoor public place	30.7 (28.2-33.2) (6,751)	29.1 (26.7-31.7) (2,958)	32.2 (28.7-35.9) (3,792)
Saw anyone smoking inside the school building or outside on school property	45.6 (42.5-48.8) (6,740)	50.2 (46.7-53.7) (2,955)	41.2 (37.8-44.6) (3,784)
Susceptibility to tobacco use			
Never tobacco users susceptible to tobacco use in the future	19.1 (17.5-20.7) (5,021)	22.1 (19.1-25.5) (1,954)	16.6 (14.9-18.4) (3,066)

Table 1 Prevalence of tobacco product use and second-hand smoke exposure among students aged 13-15 years (continue)

Topics	Prevalence (%) (95% CI) (n)		
	Total	Male	Female
Never smokers who thought they might enjoy smoking a cigarette	16.5 (13.5-20.0) (5,087)	21.3 (17.7-25.4) (1,992)	12.6 (9.8-16.1) (3,094)

4. The access to tobacco products by students

The study found that 37.1% of the students (95% CI: 33.4-40.9) had started smoking at the age of 12 to 13 years. It was also found that 52.7% (95% CI: 43.7-61.6) of the students had purchased cigarettes from stores or small grocery shops. Among the students who were current users of tobacco products, 33.6% (95% CI: 26.8-41.3) reported that they had not been denied the purchase of cigarettes, despite being underage. Furthermore, female students were found to be less likely to be denied cigarette purchases compared to male students (Table 2).

5. The cessation of tobacco product use

Among the students who were current users of tobacco products, 59.0% (95% CI: 50.9-66.7) expressed a desire to quit smoking immediately. During the past 12 months, 76.9% (95% CI: 72.3-80.9) had attempted to quit smoking. However, only 20.8% (95% CI: 16.9-25.3) had received assistance or advice from professionals to help them quit (Table 2).

6. Knowledge and Attitudes toward tobacco

The study found that 18.4% of the students (95% CI: 16.5-20.5) believed that once a person started smoking tobacco products, it was difficult to quit. Additionally, 16.7% of the participants believed that smoking would help them feel more relaxed during parties, social gatherings, or other social events (Table 2).

Table 2 Characteristics of students aged 13 - 15 years who currently use tobacco products

Topics	Percent (95% CI) (n)		
	Total	Male	Female
The age when you first started smoking a cigarette (year)			
7 years old or younger	8.1 (6.4-10.1) (1,380)	9.3 (6.9-12.5) (805)	5.8 (3.7-8.8) (575)
8 or 9 years old	13.4 (11.4-15.6) (1,380)	16.7 (13.8-20.1) (805)	7.2 (5.2-9.8) (575)
10 or 11 years old	19.0 (15.9-22.5) (1,380)	20.4 (17.0-24.3) (805)	16.4 (11.8-22.4) (575)
12 or 13 years old	37.1 (33.4-40.9) (1,380)	33.0 (28.3-38.1) (805)	44.4 (38.6-50.5) (575)
14 or 15 years old	22.5 (19.1-26.4) (1,380)	20.5 (16.3-25.5) (805)	26.2 (21.0-32.1) (575)
Access and availability			
Purchased from a store or small grocery	52.7 (43.7-61.6) (442)	50.1 (40.1-60.1) (280)	58.7 (46.4-70.1) (162)

Table 2 Characteristics of students aged 13 - 15 years who currently use tobacco products (continue)

Topics	Percent (95% CI) (n)		
	Total	Male	Female
Purchased from a stall or flea market	10.0 (6.6-14.8) (442)	11.8 (7.3-18.6) (280)	5.8 (3.0-11.0) (162)
Purchased from a convenience store	9.2 (6.1-13.6) (442)	9.0 (5.8-13.9) (280)	9.6 (5.1-17.3) (162)
Got them from someone else	10.3 (6.5-16.0) (442)	9.4 (5.3-16.4) (280)	12.3 (7.7-19.1) (162)
Got them by borrowing them	13.6 (7.7-22.8) (442)	16.0 (9.1-26.7) (280)	8.3 (4.3-15.4) (162)
Got them some other way	4.1 (2.0-8.2) (442)	3.6 (1.3-9.7) (280)	5.3 (2.9-9.5) (162)
Current cigarette smokers who were not prevented from buying cigarettes because of their age	33.6 (26.8-41.3) (318)	33.1 (25.1-42.2) (201)	34.8 (28.0-42.3) (117)
The cessation of tobacco product use			
Tried to stop smoking in the past 12 months	76.9 (72.3-80.9) (598)	76.8 (70.9-81.9) (366)	77.0 (67.5-84.3) (232)
Want to stop smoking now	59.0 (50.9-66.7) (590)	59.8 (51.4-67.7) (363)	57.5 (45.3-68.8) (227)
Thought they would be able to stop smoking if they wanted to	68.2 (62.2-73.6) (600)	66.7 (58.9-73.7) (369)	71.3 (63.9-77.8) (231)
Have ever received help/advice from a program or professional to stop smoking	20.8 (16.9-25.3) (634)	21.0 (16.6-26.3) (389)	20.4 (14.4-28.0) (245)
Knowledge and attitudes toward tobacco			
Definitely thought it is difficult to quit once someone starts smoking tobacco	18.4 (16.5-20.5) (6,751)	15.5 (13.5-17.7) (2,958)	21.3 (18.9-23.9) (3,792)
Thought smoking tobacco helps people feel more comfortable at celebrations, parties, and social gatherings	16.7 (15.0-18.5) (6,748)	15.4 (13.9-17.1) (2,957)	17.9 (15.7-20.3) (3,790)

7. The advertising and promotion of tobacco products (pro-tobacco messages)

The study found that, within the past 30 days, 31.3% of students (95% CI: 29.2-33.6) who visited tobacco product retail locations had seen tobacco product advertisements and promotions at points of sale. Additionally, 31.7% (95% CI: 29.8-33.6) had encountered advertisements or promotions for cigarettes or other tobacco products online, and 48.0% (95% CI: 45.2-50.9) had seen e-cigarette advertisements or promotions on social media. Among the students who had access to television, videos, or movies during the past 30 days, 68.1% (95% CI: 65.6-70.5) had seen tobacco product advertisements or promotions through those media. Furthermore, 11.1% of the students (95% CI: 9.0-13.5) reported having received free cigarettes or other tobacco products from tobacco distributors (Table 3).

8. The receipt of information regarding anti-smoking messages

The study found that, within the past 30 days, 61.3% of students (95% CI: 58.8-63.7) had seen or heard anti-smoking messages through various media, including television, radio, the internet, billboards, posters, newspapers, magazines, or movies. Furthermore, 62.4% of the students (95% CI: 59.2-65.5) reported encountering anti-smoking messages while attending sports events or social gatherings. Additionally, within the past 12 months, 65.8% of the students (95% CI: 63.8-67.8) had learned about the dangers of cigarettes or other tobacco products in their classrooms. (Table 3)

Table 3 Exposure to pro-and anti-tobacco advertising among students aged 13-15 Years

Topics	Percent (95% CI) (n)		
	Total	Male	Female
Pro-Tobacco advertisements			
Noticed tobacco advertisements or promotions at points of sale (Among all students in the past 30 days)	25.6 (23.8-27.5) (6,749)	25.4 (23.0-27.8) (2,959)	25.9 (23.7-28.2) (3,789)
Noticed tobacco advertisements or promotions at points of sale (Among those who visited a point of sale in the past 30 days)	31.3 (29.2-33.6) (5,562)	32.2 (29.4-35.1) (2,373)	30.6 (28.1-33.2) (3,188)
Noticed anyone using tobacco on television, videos, or movies (Among all students in the past 30 days)	54.3 (50.9-57.7) (6,745)	51.8 (47.4-56.3) (2,955)	56.7 (53.5-59.8) (3,789)
Noticed anyone using tobacco on television, videos, or movies (Among those who watched television, videos, or movies in the past 30 days)	68.1 (65.6-70.5) (5,431)	67.1 (63.5-70.5) (2,314)	69.0 (66.5-71.3) (3,116)
Noticed advertisements for manufactured cigarettes or tobacco products on the Internet	31.7 (29.8-33.6) (2,114)	30.5 (28.7-32.5) (899)	32.8 (30.2-35.5) (1,215)
Noticed electronic cigarette advertisements on social media	48.0 (45.2-50.9) (3,342)	41.7 (38.6-45.0) (1,266)	54.2 (50.4-57.9) (2,075)
Ever offered a free tobacco product from a tobacco company representative	11.1 (9.0-13.5) (6,739)	15.0 (12.5-17.8) (2,954)	7.2 (5.5-9.4) (3,784)
Owned something with a tobacco brand logo on it	12.5 (10.5-14.9) (6,737)	17.3 (14.7-20.3) (2,952)	7.8 (5.6-10.9) (3,784)
Anti-tobacco messages			
Noticed anti-tobacco messages in the media in the past 30 days	61.3 (58.8-63.7) (6,746)	60.1 (57.9-62.3) (2,956)	62.4 (58.9-65.7) (3,789)
Noticed anti-tobacco messages at sporting or community events (Among all students)	27.3 (25.2-29.5) (6,746)	25.4 (23.0-28.0) (2,955)	29.2 (26.6-31.9) (3,790)
Noticed anti-tobacco messages at sporting or community events (Among those who attended sporting or community events in the past 30 days)	62.4 (59.2-65.5) (2,972)	65.8 (62.6-68.8) (1,146)	59.8 (55.7-63.7) (1,826)
Taught in school about the dangers of tobacco use in he past 12 months	65.8 (63.8-67.8) (6,750)	65.1 (62.3-67.9) (2,957)	66.6 (63.4-69.6) (3,792)
Current smokers who noticed health warnings on cigarette packages	91.1 (87.4-93.8) (669)	89.8 (85.0-93.2) (412)	93.8 (88.8-96.7) (257)

Discussion

1. The prevalence of tobacco product use

The use of all types of tobacco products is found to be more prevalent among male students than the female. The use of tobacco products in the past three survey periods (in 2005, 2009, and 2015) shows a downward trend among Thai students aged 13-15 using smoke-producing tobacco products (such as cigarettes, cigars, and smokeless tobacco). Compared to other countries in Southeast Asia, however, the prevalence of tobacco use is still lower than in Myanmar, the Philippines, and Malaysia[9]. It demonstrates the strength of the law, as Thailand has strict regulations and laws controlling tobacco products, such as the prohibition of selling cigarettes to children and youth under the age of 20, the ban on advertising and promoting tobacco products, and the restriction on tobacco product displays. However, challenges remain as online media and other cultural trends still portray images that may attract some individuals to smoking.

However, what is extremely concerning is that the survey results show that the rate of e-cigarette use among Thai children and youth has increased significantly. The rate of e-cigarette use among school children has surged dramatically over just 7 years, rising from 3.3% to 17.6%, a 5.3-fold increase. This is particularly notable among female students, whose e-cigarette use increased by 7.9 times (from 1.9% to 15.0%). Meanwhile, male students showed a 4.3-fold increase in e-cigarette use (from 4.7% to 20.2%). This trend aligns with the National Statistical Office's survey in 2021, which found that e-cigarette use among individuals aged 15 and above has increased, particularly in the 15-24 age group[1]. The target group of the e-cigarette industry is striving in every way to make a profit and attract new customers through marketing strategies, particularly by encouraging children and young people to access e-cigarettes with various marketing tactics. These efforts include designing products with a modern appearance and enhancing the flavor and aroma of e-liquids, offering over 90 types with 16,000 different flavors[10]. Sales channels encompass electronic media, computer networks, social media platforms, and a variety of promotional activities.

2. Exposure to second-hand smoke

Students have the opportunity to be exposed to cigarette smoke from various sources, both at home and in public places. 26.0% of students are exposed to cigarette smoke at home, higher than the 23.7% reported in the National Statistical Office survey[1]. This reflects the issue of smoking among household members, which may have an impact on the health of children and adolescents. Even more concerning is that 45.6% of students have seen people smoking within the school premises or outside the classrooms, which could influence their attitudes and behaviors toward smoking. This is especially true during a stage of life when their environment may more easily influence young people. Witnessing such behavior in school, a place that should be smoke-free may reduce the effectiveness of preventive measures and education about the harms of smoking.

3. The access to tobacco products by students

Around 37.1% of students started smoking at the age of 12-13, which is still an age of minority. Starting to smoke at such a young age increases the risk of nicotine addiction and health problems in the future[11]. Additionally, 52.7% of students

purchased cigarettes from stores and small convenience shops, and 33.6% of students who currently use tobacco products could buy cigarettes without being refused, even though they were under the legal age. This reflects the insufficient enforcement of the law. Female students were less likely to be denied the purchase of cigarettes compared to male students due to gender attitudes or a lack of awareness among male students. This situation highlights the need to strengthen the enforcement of the law that prohibits the sale of cigarettes to individuals under the age of 20, as stated in the Tobacco Product Control Act B.E. 2560[12].

4. The cessation of tobacco product use

Currently, 59.0% of students who use tobacco products have a strong desire to quit smoking immediately, and in the past 12 months, 76.9% of students have attempted to quit smoking. However, only 20.8% of students have received help or advice from experts to quit smoking, which reflects the insufficiency of the smoking cessation support system for youth smokers. The fact that many students wanted to quit smoking and try to do so, but only a few received help from experts which might be due to several factors, such as the lack of counseling services, unawareness of available help, or lack of support from family and society. Several studies suggested that counseling and using effective smoking cessation methods, such as behavioral therapy programs and nicotine replacement therapy, could increase the chances of successfully quitting smoking[13].

5. Knowledge and attitudes toward tobacco

18.4% of students believe that quitting smoking is difficult after they start, and 16.7% think that smoking helps them feel relaxed during social gatherings or activities. These factors reflect attitudes and beliefs that may influence youth smoking behavior, which could be because tobacco products, including e-cigarettes, are now flavored to attract children and adolescents. This makes smoking less bothersome to others, leading to a sense of no need to quit, which can lead to addiction and long-term health risks. This aligns with data from the World Health Organization (WHO) in 2024, which reports that the tobacco industry uses marketing strategies targeting children and adolescents by designing products with appealing flavors, such as candy and fruit flavors. Additionally, research in the United States found that more than 70% of youth who use e-cigarettes said they would quit if the products only had tobacco flavor[14]. Moreover, e-cigarette use among youth increases the risk of transitioning to smoking conventional cigarettes by nearly three times compared to youth who do not smoke[15].

6. The advertising and promotion of tobacco products (Pro-tobacco messages)

In the past 30 days, students who visited tobacco product retail locations observed advertising and promotional activities at the point of sale; and 31.3% of them indicated that the tobacco industry currently uses proactive advertising and promotional strategies, which are considered a significant barrier to tobacco control. Underage students are considered a vulnerable group and may easily be enticed. This finding was consistent with previous study in that point-of-sale promotion was a risk factor that can lead to smoking behavior among children and adolescents in the future[16]. Furthermore, in the United States[17] and Israel[18], promotion at the point of sale was also observed, where tobacco manufacturers created unique promotions to boost sales and offer discounts to retailers to display products in prominent positions in

stores. Additionally, sales staff provided product usage recommendations.

The increase in the visibility of advertisements, from 27.0% to 48.0% in the previous survey, might be attributed to the advancement of current technology and easier access to online media. The e-cigarette industry is doing everything it can to seek profit and new customer segments through marketing strategies, aiming to bring back those who have quit smoking traditional tobacco cigarettes and get them addicted to nicotine again. This is in line with recent research, which found that e-cigarette advertisements on online media such as Facebook, Instagram, and Line significantly affect the smoking behavior of youth in Thailand[19]. The advertising sector often uses an image that appears modern and attractive and shows that it suits the lifestyle of today's youth. Online media also employs advertising techniques that make these products seem safer and more appealing, such as featuring celebrities, which helps increase interest and encourages trial among young people[20]. The excessive use of social media has also been found to be linked to behavioral problems among youth, which may lead to an increased likelihood of risky behaviors, such as smoking[21-22].

Receiving free tobacco products from distributors is considered an important strategy that helps reduce barriers to access to these products, especially for children and adolescents who have never smoked before. This results in a higher likelihood of them trying to smoke. Several studies have shown that distributing free samples can encourage youth to start smoking[23]. At the same time, owning items with the logo of a tobacco company, such as bags, shirts, lighters, plates, bowls, and calendars, serve as advertising to promote the image of tobacco product packaging. This is considered a primary method used by the tobacco industry as a strategy to create new smokers and encourage existing smokers not to quit[18].

7. The receipt of information regarding anti-smoking messages

In the past 30 days, 61.3% of students have seen or heard anti-smoking messages from various media such as television, radio, the internet, and billboards. Additionally, 62.4% of students have encountered similar messages at sports events or social gatherings. This suggests that using public spaces as communication channels can increase youth awareness, aligning with research demonstrating the media's influence on smoking prevention. The research indicates that media campaigns can reduce smoking rates, particularly among youth who do not yet have regular smoking habits[24]. Seeing or hearing information about the dangers of cigarettes from various media may help change attitudes and reduce the likelihood of youth starting to smoke. However, the campaign's effectiveness depends on the frequency and the content's ability to reach the target audience effectively.

Conclusion

Although the use of tobacco products among Thai students has decreased, there is still a growing concern, particularly regarding e-cigarettes, which have experienced a dramatic increase in usage over the past seven years. Children and youth are the target demographic of the e-cigarette industry, which employs various marketing strategies to generate profits and attract new customers. These strategies, especially ones designed to encourage children and youth to access e-cigarettes, are particularly concerning. Moreover, children and youth are influenced by

tobacco product advertisements and promotions through various channels, such as points of sale, online media, and free giveaways. These factors heighten the likelihood of young people beginning to use tobacco products. Thailand must adopt measures to prevent and control the proliferation of e-cigarettes. These include enhancing the effectiveness of law enforcement processes to prevent and suppress the use of electronic cigarettes, particularly by intercepting their importation via land, sea, or air, as well as regulating advertising, sales promotions, and distribution through digital networks and social media platforms. These efforts should be executed in an integrated manner in close collaboration with all relevant agencies across sectors, both at the central and local levels. Furthermore, public communication regarding the harms and dangers of electronic cigarettes should be intensified to raise awareness among children, youth, and the general public. Additionally, it is essential to bolster the capacity of network partners to aid in the prevention and control of e-cigarettes, promote smoking cessation and access to comprehensive services, and ensure the enforcement of policies and measures to combat their spread. This will significantly help control the spread of e-cigarettes and elevate it to a national initiative.

Limitations

1. The survey contained a relatively large number of questions, which may cause inconvenience for respondents in answering.

2. Respondents may not be able to report accurate information about their smoking behavior due to shame or fear of legal consequences.

3. This survey focuses exclusively on students within the formal education system. Therefore, the research findings may not fully represent all early adolescents, particularly those outside the education system

Suggestions

A longitudinal study should be conducted to track the long-term trends of smoking behavior changes. In addition to the survey, in-depth interviews or behavioral observations should be conducted to enhance the credibility of the data.

Acknowledgements

We would like to express our sincere gratitude to the World Health Organization Thailand, the Centers for Disease Control and Prevention (CDC), the Faculty of Public Health Mahidol University, and the working group on the development of the Thai youth tobacco consumption survey model for their collaboration in designing developing the survey framework, reviewing, and providing valuable suggestions. Their contributions have been instrumental in providing essential data for researchers to study and analyze in this research.

References

1. National Statistical Office (TH), Social Statistics Division. Health behavior of population survey 2021. Bangkok: Social Statistics Division, National Statistic Office; 2021. (in Thai)
2. World Health Organization. WHO global report on trends in prevalence of tobacco use 2000-2030. [Internet]. [cited 2025 May 22]. Available from: https://iris.who.int/bitstream/handle/10665/375711/9789240088283-eng.pdf?sequence=1
3. World Health Organization. WHO global report on trends in prevalence of tobacco use 2000-2030. Geneva: World Health Organization;

2024.

4. Ministry of Public Health (TH). Thailand 2015 global school based-student health survey. Nonthaburi: Ministry of Public Health; 2015. (in Thai)
5. Ministry of Public Health (TH). Report on the survey of tobacco consumption among Thai youth 2009: Under global youth tobacco survey, 2009. Nonthaburi: Ministry of Public Health; 2009. (in Thai)
6. Chotbenjamaporn P, Haruhansapong V, Jumriangrit P, Pitayarangsarit S, Agarwal N, Garg R. Tobacco use among Thai students results from the 2015 global youth tobacco survey. Indian Journal of Public Health. 2017;61(5):40-6
7. Phetphum C, Prajongjeep A, Youngiam W, Thawatchaijareonying K. Susceptibility to smoking and determinants among never-smoking high school students in Thailand. Tob Induc Dis. 2023;21:02.
8. Global Youth Tobacco Survey Collaborative Group. Global Youth Tobacco Survey (GYTS): Fact sheet template, version 1.1. Atlanta, GA: Centers for Disease Control and Prevention, 2015.
9. Tan Y L, Dorotheo U. ASEAN tobacco control atlas. 6th ed. Bangkok: Southeast Asia Tobacco Control Alliance; 2024.
10. Krsemann EJZ, Boesveldt S, De Graaf K, Talhout R. An e-liquid flavor wheel: a shared vocabulary based on systematically reviewing e-liquid flavor classifications in literature. Nicotine Tob Res [Internet]. 2019 [cited 2022 Jun 8];21(10):1310-9. Available from: https://academic.oup.com/ntr/article/21/10/1310/4999218.
11. Marynak KL, Gammon DG, Rogers T, Coats EM, Singh T, King BA. Sales of nicotine-containing electronic cigarette products: United States, 2015. American Journal of Public Health. 2017;107(5):702-5.
12. Ministry of Public Health (TH), Department of Disease Control, Bureau of Tobacco Control. Tobacco products control Act B.E. 2560 (2017). Nonthaburi: Office of Tobacco Products Control Committee; 2017. (in Thai)
13. Chidera NO, John O, Walid S, Dolapo AO, Chidinma U, Lisa O, et al. A review of smoking cessation interventions: efficacy, strategies for implementation, and future directions. Cureus. 2024;16(1):e52102.
14. World Health Organization. Young people using e-cigarettes at rates higher than adults in many countries. [Internet]. [cited 2025 May 22]. Available from: https://www.who.int/news/item/23-05-2024-tobacco-and-nicotine-industry-tactics-addict-youth-for-life
15. World Health Organization. Tobacco and nicotine industry tactics: addicting youth for life [Internet]. [cited 2024 Jun 15]. Available from:https://www.who.int/thailand/news/detail/23-05-2567-tobacco-and-nicotine-industry-tactics-addict-youth-for-life.
16. Barnoya J, Colditz G, Moreland-Russell S, Cyr J, Snider D, Schootman M. Prevalence of cigarette advertising and other promotional strategies at the point of sale in St Louis, Missouri: Analysis by store type and distance from a school. Prev Chronic Dis. 2014;11:130150.
17. Bar-Zeev Y, Berg CJ, Khayat A, Romm KF, Wysota CN, Abroms LC, et al. IQOS marketing strategies at point-of-sales: a cross-sectional

survey with retailers. Tob Control 2023;32 (e2):e198-204.

18. Warren CW, Asma S, Lee J, Lea V, Mackay J. Global tobacco surveillance system: the GTSS Atlas. Atlanta: CDC Foundation; 2009.
19. Loysmut S. Spotting e-cigarette and vapes in social media: a continuing problem to tobacco product advertising and marketing control. Tob Induc Dis. 2022;19(Suppl 1):A121.
20. Ranker LR, Wu J, Hong T, Wijaya D, Benjamin EJ, Bhatnagar A, et al. Social media use, brand engagement, and tobacco product initiation among youth: evidence from a prospective cohort study. Addict Behav. 2024;154:108000.
21. Lee J, Tan ASL, Porter L, Young-Wolff KC, Carter-Harris L, Salloum RG. Association between social media use and vaping among Florida adolescents, 2019. Prev Chronic Dis. 2021; 18:200550.
22. Robertson L, Cameron C, McGee R, Marsh L, Hoek J. Point-of-sale tobacco promotion and youth smoking: a meta-analysis. Tob Control. 2016;25 (e2):e83-9.
23. Donaldson EA, Robinson JN, Nguyen Zarndt A. Association between free tobacco product sample receipt and tobacco use in youth and adults in the PATH study. Prev Med (Baltim). 2020;131: 105951.
24. Wakefield MA, Loken B, Hornik RC. Use of mass media campaigns to change health behavior. Lancet. 2010;376(9748):1261-71.