

# ผลของโปรแกรมการให้ข้อมูลข่าวสาร สร้างแรงจูงใจ และพัฒนาทักษะการป้องกันการดื่มเครื่องดื่มแอลกอฮอล์ด้วยแอปพลิเคชัน Line™ ในวัยรุ่นตอนต้น

## Effects of A Line™ Application to Promote Information-Motivation-Behavioral Skills for Alcohol Drinking Prevention among Thai Early Adolescents

### นิพนธ์ฉบับ

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วารสารไทยเภสัชศาสตร์และวิทยาการสุขภาพ 2566;18(3):264-271.

### Original Article

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Thai Pharmaceutical and Health Science Journal 2023;18(3):264-271.

### บทคัดย่อ

**วัตถุประสงค์:** เพื่อศึกษาผลของโปรแกรมการให้ข้อมูลข่าวสาร สร้างแรงจูงใจ และพัฒนาทักษะการป้องกันการดื่มเครื่องดื่มแอลกอฮอล์ด้วยแอปพลิเคชัน Line™ ในวัยรุ่นตอนต้น **วิธีการศึกษา:** การวิจัยกึ่งทดลองแบบสองกลุ่ม วัดผลก่อนการทดลอง หลังการทดลองเสร็จทันที และระยะติดตามผล 6 สัปดาห์ กลุ่มตัวอย่างเป็นนักเรียนชายและหญิงชั้นประถมศึกษาปีที่ 6 แบ่งเป็นกลุ่มทดลองและกลุ่มเปรียบเทียบกลุ่มละ 26 คน กลุ่มทดลองได้รับโปรแกรมฯ ด้วยกิจกรรมผ่านแอปพลิเคชัน Line 4 ครั้ง แต่ละครั้งห่างกัน 1 สัปดาห์ รวบรวมข้อมูลด้วยแบบสอบถามข้อมูลทั่วไป แบบสอบถามทัศนคติต่อการหลีกเลี่ยงการดื่มเครื่องดื่มแอลกอฮอล์ การรับรู้ความสามารถของตนเองในการปฏิเสธการดื่มเครื่องดื่มแอลกอฮอล์ ความตั้งใจในการไม่ดื่มเครื่องดื่มแอลกอฮอล์ วิเคราะห์ข้อมูล t-test และ Repeated Measure ANOVA **ผลการศึกษา:** ในระยะหลังการทดลองเสร็จทันทีและระยะติดตามผล 6 สัปดาห์ กลุ่มทดลองมีคะแนนเฉลี่ยทัศนคติต่อการหลีกเลี่ยงการดื่มเครื่องดื่มแอลกอฮอล์ การรับรู้ความสามารถของตนเองในการปฏิเสธการดื่มเครื่องดื่มแอลกอฮอล์ และความตั้งใจในการไม่ดื่มเครื่องดื่มแอลกอฮอล์สูงกว่าก่อนการทดลองอย่างมีนัยสำคัญทางสถิติ และสูงกว่ากลุ่มเปรียบเทียบอย่างมีนัยสำคัญทางสถิติ **สรุป:** การให้ข้อมูลที่เฉพาะเจาะจง และการสร้างแรงจูงใจทั้งส่วนบุคคลและทางสังคมที่พึงปรารถนา ร่วมกับการพัฒนาทักษะที่ตรงกับความต้องการสามารถเพิ่มคะแนนทัศนคติ การรับรู้ความสามารถของตนเอง และความตั้งใจในการไม่ดื่มเครื่องดื่มแอลกอฮอล์ของวัยรุ่นตอนต้น

**คำสำคัญ:** แนวคิดการให้ข้อมูลข่าวสาร สร้างแรงจูงใจ และพัฒนาทักษะ, การดื่มเครื่องดื่มแอลกอฮอล์, แอปพลิเคชัน Line™, วัยรุ่นตอนต้น

### Abstract

**Objective:** To examine effects of an Information-Motivation-Behavioral Skills (IMB) for alcohol drinking prevention by Line™ application among early adolescents. **Method:** This was a quasi-experimental study with control group and pretest, posttest and 6-week follow-up measures. The participants were 52 male and female grade 6 primary school students randomized to either the experimental or control group (26 each). The experimental group received the 4-week IMB for alcohol drinking prevention program by Line application. Data were collected using questionnaires for personal data, drinking refusal attitudes, perceived drinking refusal self-efficacy and drinking refusal intention. Data were analyzed using t-test and Repeated Measure ANOVA. **Results:** At post-test and follow-up, the experimental group had the higher scores of drinking refusal attitudes, perceived drinking refusal self-efficacy and drinking refusal intention compared with those at baseline and those of the control group. **Conclusion:** Providing the specific information, embedded personal and social motivation, and skill development that meet the needs could increase drinking refusal attitudes, perceived drinking refusal self-efficacy and drinking refusal intention for early adolescents.

**Keywords:** Information-Motivation-Behavioral Skill program, alcohol drinking, application Line™, early adolescents

### Editorial note

Manuscript received in original form: November 24, 2022;

Notified: December 9, 2022;

Revised: December 20, 2022;

Accepted in final form: May 27, 2023;

Published online: September 30, 2023.

Journal website: <http://ejournals.swu.ac.th/index.php/pharm/index>

## Introduction

Alcohol consumption is a worldwide problem especially in teenagers. In 2018 survey, alcohol drinking was found in 26.5% or 1 in 4 adolescents worldwide.<sup>1</sup> In Thailand, in a survey on drinking behavior and health risk behavior in 38,535 students in 117 high schools and 79 vocational schools nationwide, alcohol drinking in adolescents has been increasing from 17.5% in 2007 to 25.6% in 2016. Heavy alcohol drinking in the last 30 days has been increasing from

5.6% in 2007 to 83.1% in 2016.<sup>2</sup> Age starting alcohol drinking decreased from 19 – 24 years old to in 2017 to 13 – 14 years old in 2019, and the youngest on was 10 years old.<sup>3,4</sup> More Thai adolescents have been drinking alcohol and started drinking at younger age. This trend increases the risk of alcohol addiction in future adults.<sup>1,5</sup> Preventing alcohol drinking in younger age is therefore critical.

Early adolescents have rapid and immense physical, psychological, and social changes; their alcohol drinking could damage their growth in various aspects. Human brain could still develop until age of 25 years old.<sup>6</sup> Alcohol drinking in age younger than 25 years causes brain abnormality, decreased thinking ability and memory.<sup>7</sup> Drinkers who are young and overweight could suffer from liver enzyme abnormalities even with a small amount of alcohol.<sup>8</sup> They could also face gastritis and gastric ulcer.<sup>6</sup> Drinking alcohol in a long and continuous time poses a risk of defective mental health and is associated with depression, anxiety, and schizophrenia which could lead to self-harm. Alcohol drinking also leads to other problems such as aggressive behaviors, substance abuse which is 7-time risky in adolescents drinking alcohol, risk sexual behavior in female adolescents.<sup>9</sup>

Previous studies indicate that attitude toward alcohol drinking<sup>4,10,11</sup>, drinking persuasion<sup>12-14</sup>, and self-efficacy in refusing alcohol drinking<sup>8,15-17</sup> are crucial factors affecting alcohol drinking adolescents. The concept of Information-Motivation-Behavioral Skill (IMB Model) of Fisher and Fisher<sup>18</sup> postulates that information disseminated to target group (Information) would allow for knowledge and understanding and motivation (Motivation) would root to develop attitude, and skill development (Behavior skills) would allow for growing self-efficacy to further enhance the actual behavior to ultimately maintain such expected health behavior.<sup>18</sup>

International and national studies suggest not many investigations in adolescent behavior modification. Most studies did not employ information seeking step (Elicitation) and did not investigate alcohol drinking behavior.<sup>19-23</sup> Only the study of Ramsiri and colleagues that examines the effect of a program of information dissemination, motivation, and development of skills prevent alcohol drinking grade 9 female students using the IMB Model.<sup>24</sup> They used all three steps of IMB Model including information seeking (Elicitation), conducting activities (Intervention), and outcome assessment (Evaluation). They conducted the study both onsite and online. They found that experimental group had scores of knowledge, attitude, self-efficacy and intention not to drink alcohol at the end of the intervention and follow-up higher than those before the experiment significantly ( $P\text{-value} < 0.001$  for all and also higher those in the control group ( $P\text{-value} < 0.01$ ,  $< 0.01$ ,  $< 0.05$  and  $< 0.05$ , respectively).<sup>24</sup>

In the Covid-19 pandemic, learning was changed to online format using various software program and applications such as Google Meet, Zoom, Microsoft Team, Line. The Line application has outstanding features including personal data security and group chat that allows convenient registration and withdrawal. It is also easy to use, fast operating, and free of charge.<sup>25</sup> Line and all online platforms allow social distancing to prevent disease spreading. Since Line could be used both in smartphone and computer, it offers convenient interactive learning<sup>26</sup> which could be applied in adolescents learning.

In this present study, based on the IMB Model, the program of information seeking and dissemination, motivation, and skills to prevent alcohol drinking of Ramsiri and colleagues<sup>24</sup> was modified to suit the online learning through Line application. All activities were modified to Line online learning for primary school students which were early adolescents. The program was to promote attitude toward alcohol drinking avoidance, self-efficacy in refusing alcohol drinking, and intention/determination to resist alcohol drinking. Results could be useful in preventing alcohol drinking at the early primary prevention) in Thai early adolescents.

Specifically, we aimed to compare scores of attitudes toward alcohol drinking avoidance, self-efficacy in refusing alcohol drinking, and intention not to drink alcohol in the experimental group at before and after the program, and follow-up, and to compared scores of the of the three factors between the experimental and control groups at the end of the program and follow-up. Accordingly, it was hypothesized scores of attitudes toward alcohol drinking avoidance, self-efficacy in refusing alcohol drinking, and intention not to drink alcohol in the experimental group at the end of the program and follow-up were higher than that before the program, and scores of each of the three factors at the end of the program and follow-up in the experimental groups were higher than those in the control group.

## Methods

In this quasi-experimental controlled research, scores of each of the three factors (attitudes toward alcohol drinking avoidance, self-efficacy in refusing alcohol drinking, and intention not to drink alcohol) in the experimental and control groups were measured at before and after the program, and 6-week follow-up to prove sustainability effect of the health behavior modification.

The study population was grade 6 primary school students. The study sample was grade 6 primary school students in academic year 2022 of 1 schools under the supervision of education office of Chonburi province, Thailand. We randomized the two schools to either the experimental or control group with 26 students in each school. These two schools had comparable characteristics and environment such as comparable number of students enrolled.

The sample size was estimated based on the results of the work of Ramsiri and colleagues.<sup>24</sup> With a type I error of 5%, a power (or 1 – type II error) of 95%, and an effect size of 1.12, sample size of 22 participants in each group was needed. To compensate for a 20% attrition rate, a total of 26 participants in each group (or a total of 52 participants) were needed.

To be eligible, students had to not drink alcohol, had no difficulties learning based on advisor teachers, and had to have or be able to access electronic device for Line application. Those who had illnesses that limit alcohol drinking or were unable to attend all activities were excluded. Student participants were selected using simple random sampling with no replacement. First, two primary schools were randomly selected to be either experimental or control group. At each selected school, a class of grade 6 was randomly selected. In each selected class, all students were asked to complete a screening questionnaire on alcohol drinking. Finally, a total of 26 students who were eligible were randomly selected.

### Research instruments

The instruments consisted of the program and data collection questionnaire. The program was to promote attitude toward alcohol drinking avoidance, self-efficacy in refusing alcohol drinking, and intention/determination to resist alcohol drinking. The program consisted of activities modified from the work of Ramsiri and colleagues.<sup>24</sup> Mainly, all activities were adapted to run on Line application. These activities were based on the Information-Motivation-Behavioral Skill (IMB Model) of Fisher and Fisher.<sup>19</sup> In the first step of information seeking, we assessed knowledge, motivation and behavioral skills in preventing alcohol drinking. In the second step, activities were held to promote knowledge, motivation, and skill development in defects found in students from the first step including information provision and seeking, motivation both at personal and social level, and skill development. Four

activities were held with 60 minutes per activity, one activity session per week for four weeks.

The questionnaire for data collection consisted of 4 parts. The first part collected demographic characteristics of the participants including age, sex, academic achievement in cumulative grade point average (GPA), residence type, daily expense allowance, and family status. The second part assessed attitude toward alcohol drinking avoidance of Ramsiri and colleagues.<sup>24</sup> The 20 questions asked whether the participant agree or disagree with alcohol drinking in knowledge and understanding (7 items), feeling about alcohol drinking avoidance (7 items), and the practice of alcohol drinking avoidance (6 items). Response was a 4-point Likert-type rating scale ranging from 1-highly disagree, to 2-disagree, 3-agree, and 4-highly agree. This questionnaire had a good content validity with a content validity index of 1.00.<sup>24</sup>

The third part assessed self-efficacy in refusing alcohol drinking. The original questions were translated into Thai language in the work of Hemchayat and Yodnil.<sup>27</sup> The 14 questions asked about belief in the person's own ability to refuse alcohol drinking in various high-pressure situation. The response was a 4-point rating scale ranging from 1-no confidence at all, to 2-somewhat unconfident, 3-somewhat confident, and 4-totally confident. This questionnaire had a good content validity with a content validity index of 0.93.<sup>27</sup>

The last part of the questionnaire was questions assessing the intention not to drink alcohol. Ramsiri and colleagues<sup>22</sup> modified and translated the questions of Ford and colleagues.<sup>28</sup> The 3 questions asked the persons, for example, how they predict their alcohol in the next 1 to 5 years, and when friends persuade the drinking. Response was a 4-point rating scale ranging from 1-totally not drink, to 2-possibly drink, 3-probably drink, and 4-definitely drink. This questionnaire had a good content validity with a content validity index of 0.91.<sup>28</sup>

### Research instrument quality assurance

Questionnaires of attitude toward alcohol drinking avoidance, self-efficacy in refusing alcohol drinking, and intention not to drink alcohol were tested in 30 students with characteristics comparable to study participants. The three questionnaires had good internal consistency reliability with Cronbach's alpha coefficients of 0.80, 0.90 and 0.82, respectively.

### The experiment conduct and data collection procedure

The researcher contacted school directors for permission. Advisor teachers were contacted for study conduct. The researcher approached and randomly selected students and set Line group for both groups. Selected students were asked to complete the questionnaires before the program. Activities through Line application were held once a week in the experimental group for 4 weeks. All activities were scheduled out of regular classes. The researcher conducted the activities with research assistants to facilitate facilities in small groups. To well accommodate all students in activities, 2 Lin small groups of 13 students were set up to allow for thorough activities and assistance.

Activities in each week were as follows. In the first week, a 60-minute program “brainstorming and self-identifying” consisted of students discussing and sharing knowledge and experiences of alcohol drinking so all knowledge, motivation and skills of alcohol drinking avoidance behavior were known and learned.

In the second week, 60 minutes were spent with the activity “alcohol destroying life” to provide specific and crucial knowledge about danger of alcohol drinking based on the findings from the first-week activities. In the third week, 60-minute activities of “determination to avoid alcohol” promoted personal motivation by enhancing positive attitude. Online media about alcohol danger were presented. Students were persuaded to discuss and share situations of causes and dangers of alcohol drinking. Students were persuaded to make a promise together to stay away from alcohol which was the motivation on a personal and social level. Peers and senior peers were encouraged to influence each other by proposing ways to avoid or refuse alcohol drinking pressure, motivating the determination and attitude toward refusing alcohol drinking. Public service announcement works of artists and net idols who do not drink were used to motivate students.

In the fourth week, a 60-minute activity of “doing and learning the danger of alcohol” was used to train skills to prevent alcohol drinking. Demonstration and reverse demonstration of skills were done through role-playing and sharing problems and obstacles. At the end of the activities, all study factors were assessed using the same questionnaire before the program. At 10<sup>th</sup> week or follow-up, the study factors were assessed using the same questionnaire at the end of the program.

For control group, students were taught in regular classes. They were assessed for all study factors with the questionnaire and three time points similarly to those in the experimental groups. After the research conduct and follow-up, the researcher gave the tested program with all materials and devices for Line to be implemented in students in the control group for teachers to conduct the activities. The researcher trained teachers for conducting activities and provided advice when needed.

### Ethical considerations for participant protection

The study was approved by the Ethics Committee for Human Study of Burapha University (approval number: HS 029/ 2565; approval date: June 17, 2022). Students were informed about objectives, steps, and voluntary nature of the study. Written assent from students and consent from their parent were obtained one week before the study start.

### Data analysis

Descriptive statistics including mean with standard deviation and frequency with percentage were used summarize demographic characteristics and study factors of the participants. Comparisons of differences of each of study factors in the two groups were done using independent t test and Repeated Measure ANOVA. For any significant differences from the Repeated Measure ANOVA, pairwise comparisons with dependent t test were done with Bonferroni's adjustment.

## Results

Of the 52 participants (36 in each group), participants in the experimental and control groups were comparable in age (mean =  $11.7 \pm 0.49$  and  $11.5 \pm 0.51$  years, respectively), sex (female of 65.34% and 53.8%, respectively), cumulative GPA ( $3.2 \pm 0.59$  and  $3.3 \pm 0.43$ , respectively). Both groups had a daily allowance of 70 Baht. Most in the experimental and control groups lived with their parents (76.9% and 58.8%, respectively). All these characteristics between the two groups were not significantly different. For study factors, scores of attitudes toward alcohol drinking avoidance, self-efficacy in refusing alcohol drinking, and intention not to drink alcohol scores in the two groups were not significantly different (Table 1).

**Table 1** Scores of study factors the participants (N = 52).

Study factors	Experimental group (n = 26)		Control group (n = 26)		t	df	P-value
	Mean	SD	Mean	SD			
Attitude toward alcohol drinking avoidance	67.8	4.98	66.0	6.18	1.16	50	0.25
Self-efficacy in refusing alcohol drinking	42.1	10.76	39.2	10.48	1.01	50	0.32
Intention not to drink alcohol	10.0	2.04	9.6	2.04	0.68	50	0.50

Based on repeated measure ANOVA, scores of attitudes toward alcohol drinking avoidance of the two groups were significantly different (P-value < 0.001). Changes in attitude scores of the two groups over time was significant (P-value < 0.05). While attitude scores seemed to increase over time in the experimental group, scores in the control group decreased over time (P-value < 0.001 for group\*time point interaction term). For within-group change, the upward change in attitude scores in the experimental group was significant (P-value < 0.001) while no significant change was found in the control group (Table 2).

Scores of self-efficacy in refusing alcohol drinking of the two groups were significantly different (P-value < 0.001). Changes in self-efficacy scores of the two groups over time was significant (P-value < 0.01). While self-efficacy scores seemed to increase over time in the experimental group, scores in the control group decreased over time (P-value < 0.01 for group\*time point interaction term). For within-group change, the upward change in self-efficacy scores in the experimental group was significant (P-value < 0.01) while no significant change was found in the control group (Table 2).

Scores of intention not to drink alcohol of the two groups were significantly different (P-value < 0.01). Changes in self-efficacy scores of the two groups over time was not significant. While self-efficacy scores seemed to slightly increase over time in the experimental group, scores in the control group remained stable over time with significance (P-value < 0.01 for group\*time point interaction term). For within-group change, the upward change in self-efficacy scores in the experimental group was significant (P-value < 0.01) while no significant change was found in the control group (table 2).

**Table 2** Comparisons of scores of each of study factors using repeatd measure ANOVA (N = 52).

Difference	Mean $\pm$ SD		Between-group difference (overall)
	Experimental group (n = 26)	Control group (n = 26)	
Attitude toward alcohol drinking avoidance			
Before	67.8 $\pm$ 4.98	66.0 $\pm$ 6.18	P-value < 0.001
After	73.2 $\pm$ 5.56	64.7 $\pm$ 6.33	
Follow-up	72.3 $\pm$ 6.37	63.9 $\pm$ 6.22	
Within-group difference (in each group)	P-value < 0.001		NS
Within-group difference (overall)			
Time point	< 0.05		
Group*Time point	< 0.001		
Self-efficacy in refusing alcohol drinking			
Before	42.12 $\pm$ 10.76	39.15 $\pm$ 10.47	P-value < 0.001
After	49.19 $\pm$ 6.90	38.42 $\pm$ 9.69	
Follow-up	49.85 $\pm$ 5.39	39.58 $\pm$ 6.70	
Within-group difference (in each group)	P-value < 0.01		NS
Within-group difference (overall)			
Time point	< 0.01		
Group*Time point	< 0.01		
Intention not to drink alcohol			
Before	10.0 $\pm$ 2.04	9.6 $\pm$ 2.04	P-value < 0.01
After	11.3 $\pm$ 0.97	9.3 $\pm$ 2.24	
Follow-up	11.3 $\pm$ 1.13	9.5 $\pm$ 2.14	
Within-group difference (in each group)	P-value < 0.01		NS
Within-group difference P-value			
Time point	NS		
Group*Time point	P-value < 0.01		

Since within-group changes in the experimental group were statistically significant for each of all study factors, pairwise comparisons with Bonferroni adjustment were performed to prove which pairs were statistically significant. It was found that attitude scores after the experiment and at follow-up were significantly higher than that before the experiment (P-value < 0.001 and < 0.01, respectively). Self-efficacy scores after the experiment and at follow-up were significantly higher than that before the experiment (P-value < 0.05 for both). Intention scores after the experiment and at follow-up were significantly higher than that before the experiment (P-value < 0.01 and < 0.05, respectively). Scores of each of the three study factors after the experiment and that at follow-up were not statistically different (Table 3).

**Table 3** Pairwise comparisons of scores of study factors in the experimental group (N = 26).

Study factors	Mean	P-value
Attitude toward alcohol drinking avoidance		
Before	67.8 $\pm$ 4.98	
After	73.2 $\pm$ 5.56	< 0.001 <sup>a</sup>
Follow-up	72.3 $\pm$ 6.37	< 0.01 <sup>b</sup>
Self-efficacy in refusing alcohol drinking		
Before	67.8 $\pm$ 4.98	
After	73.2 $\pm$ 5.56	< 0.05 <sup>a</sup>
Follow-up	72.3 $\pm$ 6.37	< 0.05 <sup>b</sup>
Intention not to drink alcohol		
Before	10.0 $\pm$ 2.04	
After	11.3 $\pm$ 0.97	< 0.01 <sup>a</sup>
Follow-up	11.3 $\pm$ 1.13	< 0.05 <sup>b</sup>

<sup>a</sup> Paired t-test with Bonferroni adjustment.

<sup>b</sup> Comparison of score before and after the experiment.

<sup>c</sup> Comparison of score before the experiment and at follow-up.

## Discussions and Conclusion

In this quasi-experimental study, early adolescents had scores of attitudes toward alcohol drinking avoidance, self-efficacy in refusing alcohol drinking, and intention not to drink alcohol after the intervention and at follow-up higher than that before the intervention. Over time, scores of each of these three study factors were higher than those in the control group.

This effective intervention to improve scores of attitudes, self-efficacy and intention in avoiding alcohol drinking could be because it allowed early adolescent students to learn systematically step by step through information seeking, motivation and skill development based on the Information-Motivation-Behavioral Skill (IMB Model) as follows.

The first activity of information seeking (Elicitation) was from sharing thoughts and experience among peers. They understand the cause of alcohol drinking such as stress from various sources. Personally, adolescents face a large amount of homework, unfinished homework, being disappointed in love affair, being punished, being bored, feeling to try new things, wanting to have fun and relaxation. For environment, adolescents feel being pressured to drink from friends and being unable to refuse friends and being pressed to drink with family members. Adolescents perceived negative effects of drinking such as headache, stomachache, liver disease, loss of conscience, confusion, uncontrolled emotion, loss of money, poor learning, risk of accident, problems with others, broken family, and risk of sexual interaction. However, adolescents viewed alcohol drinking as fun, being relaxed, relieving stress, getting along with friends, and keeping friends happy. Unfortunately, early adolescents lacked knowledge about chemical components in alcohol, products of alcohol, mechanism of action of alcohol, effects of alcohol on organs, diseases caused by alcohol, and laws concerning alcohol. Recommendations to help adolescents avoid alcohol successfully include refusing skill when persuaded or pressured, stress management when instress, and decision-making skill when wanting to try alcohol. This knowledge led to designing activities for information seeking (Information), motivation developing (Motivation) and skill building (Behavior skills) which served the need of the adolescents as follows.

For Information, the program provided knowledge about components and mechanisms of action of alcohol, effects of

alcohol on body, and laws regarding alcohol control using various media, games, brainstorming, and self-learning from provided materials. These activities fill the lacking knowledge therefore it served specific needs for specific group of learners. This specific knowledge affects the target behavior directly and could lead to the actual behavior.<sup>18</sup>

Early adolescents also received motivation both personal and social ones. In developing personal motivation, adolescents viewed videos about the danger of alcohol and discussed it. Adolescents were concerned about negative effects of alcohol such as feeling ill, disrupted learning, loss of conscience, making parents sad and sorry, causing family problem, loss of money, causing accident, injuring others, and killing others. On the other hand, staying away from alcohol could make the body healthy, better learning, not losing money, having a happy family, no accident, and no trouble to others. Adolescents shared their experiences such as “my dad was drunk and physically harmed my mom. Now they are separated. I will not drink alcohol. I don’t want to disappoint my parents.”, “I saw a drunk person shooting each other and a person was shot and brought to the hospital. I don’t like it. It’s scary. I will not drink alcohol” “It was about 4 – 5 PM, my grandfather was drunk and stabbed my grandmother. They brought her to the hospital. Alcohol is bad. You don’t recognize people and harm them. I won’t drink alcohol.” “On the way to buy some snacks, my brother and I met a drunk person wandering aimlessly damaging stores. We were scared and ran back home. When I grow up, I will not drink alcohol and substance.” Based on questionnaire, most adolescents were concerned about benefits of not drinking alcohol such as health, benefits for one themselves and their family, saving money, keeping conscience and self-control, less chance of fight, better learning and working, and less chance of unintended sexual interaction.

Social motivation was built by having adolescents learn from friends with comparable characteristics and/or role-models with attraction and not drinking alcohol. They shared their beliefs and experiences in refusing alcohol. Adolescents viewed public service announcement videos of movie stars and singers to persuade no drinking with promising messages such as “I promise I will not drink alcohol.” “I will not follow friend’s persuasion. I will study hard for my parents. I will not be pressured by friends. I will work hard for my parents. I will not make my parents disappointed.” “I will not drink alcohol

even though I am pressured to drink. This is because alcohol is bad. Alcohol took a lot of people I know. I want live long with my mom." "I promise not to drink alcohol because it causes problems in family, relatives, and siblings." "I promise not to use narcotics and substances. I will not be pressured by friends to use substances." These messages reflect motivation which could further enhance positive attitude and value. Changes in belief affect the following actual actions or behaviors.<sup>18</sup>

For the component of skill development (Behavior skills), specific desirable behaviors include skills to refuse persuasion and pressure to drink alcohol without upsetting friends, stress management skills, and decision-making skills when confronting the desire to try alcohol. Adolescent participants learned and were trained by demonstration and reverse demonstration. In pair, with simulated scenarios, they were trained to refuse persuasion and pressure to drink in daily life. They would be able to refuse alcohol drinking. Based on questionnaire answers, they were confident to successfully refuse alcohol when upset, alone, anxious, angry, agitated, or pressured to drink. Specific crucial skill training allows confidence in performing the actual behavior.<sup>18</sup>

Information specific to problems and target group and motivation both personal and social to perform the behavior could help develop positive attitude and potential to refuse alcohol drinking among adolescents. This leads to stronger self-efficacy, confidence in performing the behavior, and stronger intention not to drink alcohol which could directly foster their actual behavior.

Our findings are consistent with previous studies both international and national studies. A study in Thailand of Nuntachan and colleagues showing that HIV-infected adolescents had more discipline to take medications after the program to motivate compliance to HIV medications.<sup>19</sup> Adolescents also had higher CD4 cell counts when compared with those in the control group.<sup>19</sup> A study of Suwalak and colleagues also showed that grade 10 students had better knowledge, attitude, social motivation, decision-making skills, self-efficacy and behavior to prevent sexual interaction after the program. These measures were also better than those in the control group.<sup>21</sup> A study of Elif Hicran and Eda also revealed that program to provide information, enhance motivation and develop skills to control metabolism in type 1 diabetes adolescents improved knowledge, personal and

social motivation and behavioral skills significantly, and a decreased HbA1c significantly at 3 and 6 months.<sup>22</sup> A study by Yoshiko revealed that the program to promote condom in Japanese late adolescents by promoting information, motivation and skills resulted in better knowledge about HIV and sexually transmitted diseases, self-efficacy in using condom, and knowledge about condom use at 1 and 3 months follow-up than those in the control group significantly.<sup>23</sup>

This study has certain limitations. With the online operation of Line, some instability of the signal could interrupt the activities. The effectiveness of the program could then be slightly limited. Files shared through Line sometimes face expiration date. Therefore, the expiration date of files should be thoroughly checked. The need to use online Line application could be viewed as limitation; however, its use indicates that online program could also be effective in improving behavior.

Our findings could be useful in real-life practice. Online signal should be checked for stability before the activities start. All places and times should be scheduled at least one day before the appointment. Participants could be readily prepared, agreed to the rules to do activities. Activities should emphasize participating ones. Male and female adolescents should be assorted in each activity group with clear roles and responsibilities. Facilitators should encourage students to participate. Short activities for relaxation should be incorporated in the program. In application, these activities could be used in regular classes in certain subjects or courses. Teachers could be trained to conduct these activities. For future research, a longer follow-up period, 3 or 6 months, should be used to test the sustainability of the program effects. Booster session should be tested too. The program could so be tested in other behaviors such as cigarette smoking, and substance use. Other groups of adolescents could also be tested.

In conclusion, the online program using Line application to provide specific information, to enhance personal and social motivation and to develop skills to refuse alcohol drinking was found to improve scores of attitude, self-efficacy and intention to refuse alcohol drinking among Thai early adolescents.



## Acknowledgement

The authors thank Faculty of Nursing, Burapha University for financial support and all participants for their invaluable participation.

## References

1. World Health Organization. Global status report on alcohol and health 2018. Geneva. World Health Organization, 2018.
2. Usaha J, Wijitkhunakorn P, Saengam D, et al. Facts and Figures: Alcohol in Thailand. Bangkok. Center of Alcohol Studies, 2016. (in Thai).
3. Asanangkongchai S. Facts and figures: Alcohol in Thailand 2016 - 2018. Bangkok. Sahamitphatthana Printing, 2019. (in Thai).
4. Chotichai T, Mantaphan S. Factors related to alcohol drinking behaviors among high school students in Mueang Khon Kaen Municipality. *J Grad Maha Chula Univ Khon Kaen* 2019;6:282-296. (in Thai).
5. Wang ZY, Jun S, Zang JJ, Huang CH, Zou SR, Sheng G. Drinking behavior and associated factors among middle school students in Shanghai China. *Biomed Environ Sci* 2015;28:765-768.
6. Thamrangsri T, Waleewong O. Academic papers: Alcohol and brain. Bangkok. Center of Alcohol Studies, 2016. (in Thai)
7. Spear LP. Effects of adolescent alcohol consumption on the brain and behaviour. *Nat Rev Neurosci* 2018;19:197.
8. Homsin P. Concepts and theories for practice : Smoking and alcohol drinking prevention among adolescents. Chonburi. Chonburi Printing, 2015. (in Thai)
9. Thamrangsri T. Effects of Alcohol consumption situation in Thailand 2013. Bangkok. The Graphico Systems, 2013.
10. Onmou P, Chanrit K. Factors Associated with selling alcohol to adolescents by retailers in the vicinity of educational institutions in Uttaradit Province. *J Health Sci* 2020;29:590-600. (in Thai)
11. Maggs JL, Staff J, Patrick ME, Wray-Lake L, Schulenberg JE. Alcohol use at the cusp of adolescence: A prospective national birth cohort study of prevalence and risk factors. *J Adolesc Health* 2015;56:639-645.
12. Savannahian K, Komnala F, Asana S, Phachan T, Jariyawanichkul P. Prevalence and factors associated with alcohol consumption among high school students of high school in Chaiyaphum Province. *Thai J Public Health Health Sci* 2019;2:1-13. (in Thai)
13. Saelim S, Mupayak K, Suwanrupa N. Factors related to alcohol drinking behavior of adolescents. *Songklanagarind J Nurs* 2017;37:25-36. (in Thai)
14. Hung C, Chiang Y, Chang H, Yen L. Path of socialization and cognitive factors effects on adolescents alcohol use in Taiwan. *Addict Behav* 2011;36:807-8163.
15. Somjai D. Preventive alcohol beverage consumption behavior among undergraduate students: A case study in a private university. *HCU J* 2017;40:127-139. (in Thai)
16. Kunthiya W, Homsin P, Srisuriyawet R. Factors related to alcohol drinking among male vocational students in Chai Nat Province. *J Nurs Educ* 2015;8:11-26. (in Thai)
17. Elvira C, Bruna Z. Alcohol use among Italian University students : The role of sensation seeking, peer group norms and self-efficacy. *J Alcohol Drug Educ* 2011;55:17-36.
18. Fisher JD, Fisher WA. Changing AIDS risk behavior. *Psychol Bull* 1992;455-474.
19. Nuntachan N, Ketpiban N, Wisetkul N. Effect of information provision, motivation, and skill development on antiretroviral adherence among youths living with HIV. *Nurs J* 2015;42:72-83. (in Thai)
20. Kingmala C, Rawivorakul T, Phowattana A. Effect of a pregnancy prevention program for female adolescents. *J Health Nurs Res* 2015; 31:25-34. (in Thai)
21. Suwalak N, Tansakul S, Thirawiwat M, Kaewdamkeng K. Effects of an Information-Motivation-Behavioral skills program for preventing sexual intercourse among tenth grade students. *Thai J Health Educ* 2019; 42:29-42. (in Thai)
22. Elif B, Hicran C, Eda M. Effects of the information-motivation-behavioral skills model on metabolic control of adolescents with type 1 diabetes in Turkey: Randomized controlled study. *J Pediatr Nurs* 2021;58:e19-e27.
23. Yoshiko K. Effectiveness of a condom use educational program developed on the basis of the information-motivation-behavioral skills model. *JPN J Nurs Sci* 2013;10:24-40.
24. Ramsiri K, Homsin P, Srisuriyawet R. Effects of an information-motivation-behavioral skills program for alcohol drinking prevention among female adolescents. *J Nurs Sci Health* 2021;38:48-58. (in Thai)
25. Huedhun K. The influence of Line application in the present communication. *JAM* 2017;1:75-88. (in Thai)
26. Mental Health Strategy and Planning Division. New normal and changing lifestyles. 2020. ( Accessed on Oct. 20, 2021, at <https://dsp.dip.go.th/th/category/2017-11-27-08-04-02/2020-06-29-14-39-49>) (in Thai)
27. Hemchayat A, Yodnil S. Factors related to alcohol drinking among female high school students in Amphur Khowkitchakoot Chanthaburi Province. *J Educ Soc Develop* 2012; 8:115-128. (in Thai)
28. Ford KH, Diamond PM, Kelder SH, Sterling KL, McAlister AL. Validation of scales measuring attitudes, self-efficacy, and intention related to smoking among middle school students. *Psychol Addict Behav* 2009;23:271-278.