

EFFECTIVENESS OF THE ALCOHOL EDUCATION PROGRAM FOR INCREASING ALCOHOL KNOWLEDGE AMONG UNIVERSITY STUDENTS: A QUASI EXPERIMENTAL STUDY

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Keywords:	Abstract
Alcohol education program; university students; alcohol; Moderate drinkers	<p>Introduction: Alcohol is a leading public health problem worldwide. When considering only new youth drinkers, it was found that the prevalence of new drinkers is likely to increase significantly in 2021. Moderate alcohol consumption is pleasurable for many people because of its important role in social participation. The alcohol education program was developed based on Intervention Mapping: A Process for Developing Theory- and Evidence-Based Health Education Programs (Barras) to be consistent with the objectives and target groups which the male students with moderate alcohol drinking.</p> <p>Objectives: This study aimed to test the effectiveness of an alcohol education program on the knowledge about alcohol and alcohol consumption of moderate drinkers who were University students in Bangkok.</p> <p>Methods: A quasi-experiment was implemented in two universities. One hundred eighty-four moderate drinkers voluntarily participated in the program (Intervention, n = 92; Control, n = 92). The main components of the program were 1. Knowledge about alcohol consumption 2. Peer drinking 3. Social drinking 4. Influenced by the media 5. Self-efficacy 6. Useful recreational activities. Knowledge about alcohol was delivered through the LINE official account in multimedia format, three times a week. Knowledge about alcohol and alcohol consumption was assessed four times: at baseline, at exit point (6 weeks after baseline), 1 month, 3 months, and 6 months post-intervention. Data were analyzed using Chi-square, Fisher's exact test, independent t-test, and repeated measures ANOVA.</p> <p>Result and Discussion: There were positive effects of the alcohol education program on increasing knowledge about alcohol (p-value < 0.001) and reducing the Alcohol Use Disorders Identification Test (AUDIT) score (p-value < 0.001) at the 1, 3, and 6-month follow-ups.</p> <p>Conclusion:</p>

	Research suggests that the alcohol education program is effective in educating university students, particularly moderate drinkers, about alcohol consumption and in reducing their overall alcohol intake.
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Introduction

Alcohol is a leading public health problem worldwide. Each year, 3 million people die as a result of harmful drinking [1]. Alcohol consumption is the leading risk factor for mortality among males aged 15–49 years [2].

Prevalence rates of new drinkers in the population aged 15 years and over from 2012 until 2021 are likely to increase. When considering only new youth drinkers, it was found that the prevalence of new drinkers is likely to increase significantly in 2021. Moreover, the report indicated that they first tried alcohol at an average age of 20.4. The average age at which the first drink began for males was less than for females (19.6 years and 22.9 years). In addition, it was found that men drank 4.5 times more alcohol than women (46.4 and 10.8% respectively). Moreover, it is found that the three main reasons for starting to drink alcohol are friends, would like to try drinking, and drinking for socializing. [3]

Thai youth, particularly university students, should be recognized as a significant risk group for alcohol use. Several studies conducted in Thailand have reported the widespread consumption of alcohol among university students aged 18 to 20. Moreover, alcohol use among these students is associated with a range of issues, including drunk driving, health complications, and financial difficulties [4].

Bangkok is the region with the most universities and the highest proportion of heavy drinkers in the country. The rate of alcohol consumption in Bangkok is 27.2% [3].

Suan Sunandha Rajabhat University is a large university located in the inner area of Bangkok. The study of health behaviors and health risk behaviors of Suan Sunandha Rajabhat University students found that the riskiest behavior was drinking alcohol at 61.0 %. In addition, the research found that the faculty of industrial technology has healthy habits are moderate, which is at a lower level than the other.

Sixteen percent of Thai workers reported being adversely affected by a coworker's drinking. Smaller percentages (less than 1% to 12%) reported experiencing an accident or a near miss due to others' drinking. Employed men were more likely to report harm from coworkers' drinking than employed women, and their drinking patterns were associated with increased harm [5]. Therefore, implementing an initiative to reduce alcohol consumption among university students could mitigate the future impact of alcohol-related issues.

Moderate alcohol consumption is enjoyable for many individuals due to its significant role in social engagement [6]. The act of consuming alcohol within a defined limit is often intertwined with the concept of moderation in drinking. Some research contextualizes moderate drinking in relation to non-drinking activities, such as socializing or dining [7]; [8]. Consequently, moderate drinking is a multifaceted phenomenon. Findings indicate that there are various levels of influence on students' intentions to moderate their drinking, extending beyond individual factors, which further complicates the understanding of drinking moderation.

The alcohol education program was developed based on Intervention Mapping: A Process for Developing Theory- and Evidence-Based Health Education Programs [9] to be consistent with the objectives and target groups which the male students with moderate alcohol drinking.

This study, therefore, aims to test the effect of the alcohol education program on increasing alcohol knowledge and reducing alcohol consumption among university students.

Materials and methods

The alcohol education program was designed for moderate drinkers who were students at Suan Sunandha Rajabhat University. The participants were male students aged 18 to 20 years, currently in their second year, who met the screening criteria for the Alcohol Use Disorder Identification Test (AUDIT) [10], which has a score range of 8 to 19. The researcher reviewed existing literature on student alcohol consumption and developed the main components of the program based on the Transtheoretical Model (Stages of Change) [11] and Self-efficacy theory [12]. The primary components of the program included: 1. Knowledge about alcohol consumption 2. Peer drinking 3. Social drinking 4. Influenced by the media 5. Self-efficacy 6. Useful recreational activities.

The program was divided into two parts: the educational component and the motivational interviewing component. The educational segment was further divided into three lessons: Basic, Intermediate, and Advanced. Each lesson had a duration of approximately 10 minutes. The content was reviewed and approved by at least three experts. Once the knowledge content received expert approval, the researcher contacted the author of the teaching materials to develop resources that aligned with the main components of the program. These teaching materials were produced as a video featuring animated graphics. After the experts approved the content related to alcohol, the researcher collaborated with a motion graphic designer to create a storyboard and develop the educational video clip. During the educational activities, information about alcohol was delivered through the official LINE account in a multimedia format, lasting approximately 10 - 15 minutes, three times a week. The program was pilot-tested with 30 students who shared similar characteristics. The participants in the pilot test were 30 male students from the College of Innovation and Management.

Motivational interviewing [13] was employed to encourage a sample to modify their alcohol consumption behavior during the second week of the alcohol education program. The duration of the motivational interviewing session was approximately 60 minutes.

Participants and Setting

Participants in this study were university students from Bangkok. They were male students aged 19 to 21 years, currently in their second or third year of study, and met the screening criteria for the Alcohol Use Disorder Identification Test (AUDIT), which requires a score between 8 and 19.

The researcher focused on large universities ($\geq 15,001$ students) in Bangkok due to their prevalence. Studies at Suan Sunandha Rajabhat University reveal high alcohol consumption rates (61%), particularly within the Faculty of Industrial Technology (71%), compared to other faculties. Phra Nakhon Rajabhat University also exhibits high alcohol consumption, with the Faculty of Industrial Technology being the most affected. Suan Sunandha Rajabhat University served as the intervention group, and Phra Nakhon Rajabhat University as the control group, ensuring a suitable geographical distance of approximately 14 kilometers to prevent contamination between the two universities.

The target group participating in the program was selected based on specific purposive sampling criteria. The inclusion criteria were as follows: (1) Males aged 19-21 years, (2) Students identified as moderate drinkers according to the Alcohol Use Disorders Identification Test (AUDIT) with scores ranging from 8 to 19, (3) Students with no history of diagnosis, treatment, or dependence on alcohol, (4) Students who could complete the entire process, (5) Students who demonstrated the ability to understand the purpose of the study and complete the interview materials, and (6) Students who voluntarily agreed to participate in this study. The exclusion criteria included: (1) Students diagnosed with psychiatric problems by a medical professional and (2) Students planning to transfer to another faculty or university during the academic year 2023. After the screening process, students who met the inclusion criteria were invited to participate in the research. Informed consent was obtained from the students. During the research activities, if a student meets the exclusion criteria as determined by the researcher, that student will be excluded from the study.

Both the experimental and control groups will undergo baseline interviews, followed by assessments at 1-, 3-, and 6-months post-intervention.

Measurement instruments

The University Student Alcohol Consumption Questionnaire comprises four sections:

1. Personal Data (6 items) gathering socio-demographic information.
2. Student Alcohol Questionnaire (37 items) assessing alcohol knowledge, adapted from SAQ [14] with established reliability.
3. The Thai-translated AUDIT served as a standard screening tool.

It was translated into Thai and then translated back to confirm the reliability and accuracy of the translation. The test demonstrated high validity (IOC = 0.96), and its reliability was assessed at 0.78.

Data Analysis

Descriptive statistics were employed to characterize the socio-demographic characteristics of the participants. The differences between the intervention and control groups were assessed using the Chi-square test for categorical data, Fisher's exact test for ordinal data, and the independent t-test for continuous data. A Repeated Measures ANOVA was conducted to evaluate the overall change in alcohol knowledge.

Results

After administering the Alcohol Use Disorders Identification Test (AUDIT) to screen university students, only 184 eligible participants met the criteria for moderate drinkers at baseline (Intervention n=92; Control n=92). Similar to the characteristics of the initial 276 students, most socio-demographic variables among the eligible participants were comparable between the intervention and control groups. The sample characteristics indicated that the majority of both the experimental and control groups were 19 years old. Most members of the experimental group reported that they first began consuming alcohol at the age of 17. Additionally, both the experimental and control groups had family members with a history of alcohol consumption.

Testing the effect of the alcohol education program

Mean scores for the experimental and control groups were categorized by study period. The results indicated that the experimental group achieved average scores of 8.66 ± 2.16 points, 10.92 ± 1.64 points, 10.79 ± 1.65 points, 10.23 ± 1.69 points, and 10.14 ± 1.52 points in knowledge about alcohol consumption before the experiment, immediately after the experiment, and during the follow-up periods of 1 month, 3 months, and 6 months, respectively. In contrast, the control group recorded average knowledge scores of 8.08 ± 2.52 points, 8.70 ± 2.35 points, 8.25 ± 2.02 points, 7.75 ± 2.31 points, and 7.39 ± 1.66 points before the experiment, after the experiment, and during the follow-up periods at 1 month, 3 months, and 6 months, respectively, as shown in Table 1.

Table 1: The mean and standard deviation of scores on Knowledge of alcohol consumption between the experimental group and the control group over time

Outcome/Time	Experiment group (n = 92)		Control group (n = 92)	
	Mean	± SD	Mean	± SD
Knowledge of alcohol consumption				
Baseline	8.66	2.16	8.08	2.52
Exit point	10.92	1.64	8.70	2.35
1-month follow-up	10.79	1.65	8.25	2.02
3-months follow-up	10.23	1.69	7.75	2.31
6-months follow-up	10.14	1.52	7.39	1.66

Source: Rangsima Passara^a

The results of the repeated measures ANOVA analysis of mean scores regarding knowledge about alcohol consumption indicated that the mean scores changed throughout the study period. Specifically, there were significant differences in knowledge levels before the experiment, after the experiment, and during the follow-up periods of 1 month, 3 months, and 6 months. The differences between the experimental group and the control group were statistically significant (p-value < 0.001), as shown in Table 2.

Table 2: The results of the analysis of variance of the Knowledge of alcohol consumption mean results scores in the experimental and control groups were classified according to the period measured using Repeated measure ANOVA statistics

Source of variance	SS	df	MS	F	p-value
Knowledge of alcohol consumption					
Within group					
Time	246.276	2.75	89.474	81.813	<0.001
Time, Group	141.059	2.75	51.248	46.859	<0.001
Error	547.865	500.95	1.094		
Between groups					
Group	1031.170	1	1031.170	62.062	<0.001
Error	3023.961	182	16.615		

Source: Rangsima Passara^a

The experimental group exhibited average AUDIT scores of 8.99 ± 1.23 points before the experiment, 7.21 ± 1.13 points after the experiment, and 6.34 ± 1.27 points, 6.46 ± 1.12 points, and 6.42 ± 1.65 points during the follow-up periods of 1 month, 3 months, and 6 months, respectively. In contrast, the control group had average AUDIT scores of 9.08 ± 1.27 points before the experiment, 9.02 ± 1.23 points after the experiment, and 8.54 ± 1.83 points, 8.22 ± 1.12 points, and 8.52 ± 1.62 points during the follow-up periods at 1 month, 3 months, and 6 months, respectively, as shown in Table 3.

Table 3: Mean and standard deviation of scores of the AUDIT scores outcomes between the experimental group and the control group by time

Outcome/Time	Experiment group (n = 92)		Control group (n = 92)	
	Mean	± SD	Mean	± SD
AUDIT score				
Baseline	8.99	1.23	9.08	1.27
Exit point	7.21	1.13	9.02	1.23
1-month follow up	6.34	1.27	8.54	1.83
3-months follow up	6.46	1.12	8.22	1.12
6-months follow up	6.42	1.65	8.52	1.62

 Source: Rangsima Passara^a

The results of the repeated measures ANOVA analysis of the mean AUDIT scores indicated that the mean AUDIT score varied throughout the study period, including assessments conducted before the experiment, immediately after the experiment, and during follow-up periods at 1 month, 3 months, and 6 months for both the experimental and control groups. The differences observed were statistically significant (p -value < 0.001), as presented in Table 4.

Table 4: The results of the analysis of variance of the mean AUDIT scores in the experimental and control groups were classified according to the period measured using Repeated measure ANOVA statistics

Source of variance	SS	df	MS	F	p-value
AUDIT score					
Within group					
Time	374.885	3.43	109.232	79.063	<0.001
Time, Group	136.941	3.43	39.901	28.881	<0.001
Error	862.974	624.62	1.382		
Between groups					
Group	584.010	1	584.010	126.415	<0.001
Error	840.798	182	4.620		

Source of variance	SS	df	MS	F	p-value
Source: Rangsima Passara ^a					

Source: Rangsima Passara^a

Discussion

The results indicated that the effects of the alcohol education program, measured from the point of exit to the 6-month follow-up, were significantly greater in the intervention group compared to the control group. This suggests that participants' knowledge about alcohol improved after completing the program. Following the intervention, students in the intervention group demonstrated an increase in their alcohol knowledge scores from baseline to exit, and these scores remained stable until the 6-month follow-up. This finding aligns with other studies that highlight the effectiveness of alcohol education programs in reducing alcohol consumption [15].

A key factor in enhancing students' understanding of alcohol is the program's component that primarily focuses on the negative effects of alcohol, including safe drinking practices and the skills necessary to resist peer pressure related to alcohol consumption. This approach can mitigate the harmful effects of alcohol use. This aligns with other programs aimed at reducing alcohol consumption, which are designed to modify drinking behaviors among university students by improving health literacy. The study found that health literacy and alcohol consumption behaviors in the experimental group were significantly better than those in the comparison group at the .05 statistical significance level [15].

The high level of acceptability among program participants was largely due to the identification of the target group's needs. Both students and teachers were actively involved during the program's development stage, ensuring that their needs were integrated into the design. Furthermore, the program was delivered through a smartphone via the official Line account, which significantly enhanced its acceptability among students. The advantage of this smartphone approach lies in the fact that adolescents are comfortable with mobile learning and have a particular preference for receiving health information in the form of video clips rather than through face-to-face interactions. This aligns with findings from studies indicating that online coaching via mobile phones can effectively reduce alcohol consumption [16]. Additionally, it has been shown that the use of smartphones can effectively reach individuals with unhealthy alcohol use and contribute to a reduction in excessive drinking [17].

Correspondingly, AUDIT scores were significantly reduced in the intervention group at both post-intervention and follow-up follow-up, fewer a decrease in problems and risky drinking. drinking behaviors. reductions were consistently greater more pronounced the intervention than group compared to control group, reinforcing the effectiveness of the intervention in terms of mitigating the reduction in decrease use was consumption for the in group than the than in group indicating group, effect a positive the intervention on drinking behaviour in university behavior among

The ANOVA analyses confirmed significant changes in alcohol consumption behavior and knowledge between the intervention and control groups over time. The results of this study suggest that the intervention program enhanced knowledge about alcohol use and reduced alcohol-related problems among university students. These findings underscore the importance of implementing

targeted interventions to mitigate alcohol abuse and promote healthier behaviors among young adults. Future research could explore the effects of such interventions on a larger population and assess their long-term impact.

Strengths of Study

This study employs the same approach of engaging students through smartphones but enhances it by presenting information in an appealing format. This method has been refined based on student feedback to enhance accessibility and maximize student engagement.

Limitations of the Study

1. A laboratory was not available to verify alcohol consumption among university students in this study. Blood Alcohol Concentration (BAC) tests have limitations concerning the timing of blood draws following alcohol intake.
2. Participants were selected from two large universities in Bangkok; therefore, the findings of the study may not accurately represent other regions.

Recommendations

The alcohol education program demonstrated a significant improvement in participants' knowledge of alcohol following its implementation, and this knowledge was maintained at a six-month follow-up. Additionally, there was a notable reduction in alcohol consumption during the same follow-up period. Therefore, it is recommended that this course be integrated into the regular university curriculum, with support from the Ministry of Education to encourage university students to participate in the program. The findings of this study can also guide policymakers as they consider the introduction of more targeted alcohol education initiatives at other universities and in various provinces. Future research could focus on a larger population to assess the long-term effects of such interventions. Furthermore, implementing the alcohol education program among adolescents in junior high and high schools could improve accessibility and contribute to a decrease in alcohol consumption rates among younger drinkers.

Benefits and Applications

1. Advocate for the implementation of the alcohol education program at additional universities to enable evaluation across a diverse array of institutions.
2. Implement an alcohol education program for moderate-drinking freshmen by providing an online educational platform.
3. Incorporate initiatives aimed at reducing alcohol consumption into freshman activities to emphasize the benefits of the program.
4. Assess the cost-effectiveness of the alcohol education program.
5. Emphasize qualitative research to gain insights into the alcohol consumption experiences of moderate drinkers.

Declaration of Interest Statement

The authors declare that they have no conflicts of interest. They are solely responsible for the content and writing of this article.

REFERENCE

1. World Health Organization. (2019). Status report on alcohol consumption, harm and policy responses in 30 European countries 2019. In Status report on alcohol consumption, harm and policy responses in 30 European countries 2019.
2. Bryazka, D., Reitsma, M. B., Griswold, M. G., Abate, K. H., Abbafati, C., Abbasi-Kangevari, M., ... & Diress, M. (2022). Population-level risks of alcohol consumption by amount, geography, age, sex, and year: a systematic analysis for the Global Burden of Disease Study 2020. *The Lancet*, 400(10347), 185-235.
3. Luangsinsiri, C., Youngkong, S., Chaikledkaew, U., Pattanaprateep, O., & Thavorncharoensap, M. (2023). Economic costs of alcohol consumption in Thailand, 2021. *Global health research and policy*, 8(1), 51.
4. Buakate, P., Thirarattanasunthon, P., & Wongrith, P. (2022). Factors influencing alcohol consumption among university students in Southern Thailand. *Roczniki Państwowego Zakładu Higieny*, 73(4).
5. Laslett, A. M., Stanesby, O., Wilsnack, S., Room, R., & Greenfield, T. K. (2020). Cross-national comparisons and correlates of harms from the drinking of people with whom you work. *Alcoholism: clinical and experimental research*, 44(1), 141-151.
6. Dattani, S., Samborska, V., Ritchie, H., & Roser, M. (2023). Cardiovascular diseases. *Our World in Data*.
7. Ally, A. K., Lovatt, M., Meier, P. S., Brennan, A., & Holmes, J. (2016). Developing a social practice-based typology of British drinking culture in 2009–2011: implications for alcohol policy analysis. *Addiction*, 111(9), 1568-1579.
8. Supski, S., Lindsay, J., & Tanner, C. (2017). University students' drinking as a social practice and the challenge for public health. *Critical Public Health*, 27(2), 228-237.
9. Bartholomew, L. K., Parcel, G. S., & Kok, G. (1998). Intervention mapping: a process for developing theory and evidence-based health education programs. *Health education & behavior*, 25(5), 545-563.
10. Babor, T. F., Higgins-Biddle, J. C., Higgins, P. S., Gassman, R. A., & Gould, B. E. (2004). Training medical providers to conduct alcohol screening and brief interventions. *Substance Abuse*, 25(1), 17-26.
11. Prochaska, J. O., & DiClemente, C. C. (1986). Toward a comprehensive model of change. In *Treating addictive behaviors: Processes of change* (pp. 3-27). Boston, MA: Springer US.
12. Bandura, A., & Adams, N. E. (1977). Analysis of self-efficacy theory of behavioral change. *Cognitive therapy and research*, 1(4), 287-310.
13. Rollnick, S., & Miller, W. R. (1995). What is motivational interviewing?. *Behavioural and cognitive Psychotherapy*, 23(4), 325-334.
14. Engs, R. C., Diebold, B. A., & Hanson, D. J. (1996). The drinking patterns and problems of a national sample of college students, 1994. *Journal of Alcohol and Drug Education*, 13-33.
15. Ponrachom, C., & Boonchuaythanosit, K. (2022). ALCOHOL CONSUMPTION BEHAVIOR MODIFICATION OF UNDERGRADUATE STUDENTS IN THAILAND: A QUASI EXPERIMENTAL STUDY. *Malaysian Journal of Public Health Medicine*, 22(2), 1-8.
16. Tait, R. J., Paz Castro, R., Kirkman, J. J. L., Moore, J. C., & Schaub, M. P. (2019). A digital intervention addressing alcohol use problems (the "Daybreak" program): quasi-experimental randomized controlled trial. *Journal of Medical Internet Research*, 21(9), e14967.

17. Bertholet, N., Schmutz, E., Grazioli, V. S., Faouzi, M., McNeely, J., Gmel, G., ... & Cunningham, J. A. (2020). Smartphone-based secondary prevention intervention for university students with unhealthy alcohol use identified by screening: study protocol of a parallel group randomized controlled trial. *Trials*, 21, 1-8.