

Alcohol Consumption Behavior among Undergraduate Students in Thailand: Development of a New Causal Relationship Model

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Abstract

Alcohol consumption among undergraduate students in Thailand is problematic. The aim of this study was to deepen our understanding of this problem by developing a causal relationship model for the alcohol consumption behavior of undergraduate students in Thailand, and to verify the model's concordance with empirical data. Four latent variables were considered: alcohol consumption behavior, alcohol expectancy, drinking refusal self-efficacy, and health literacy. Participants included representative 1st – 5th year undergraduate students at the Thailand National Sports University, with 600 students being selected using stratified random sampling procedures. The descriptive statistics and the causal relationship model were analyzed using LISREL 8.80. The model developed was in good agreement with the empirical data ($\chi^2=228.66$, $df=79$, $p > 0.05$, $\chi^2/df=2.894$, SRMR =0.07, RMSEA =0.06, CFI =0.99, and RFI =0.98), with all computed indices passing the stipulated criteria. On the basis of the coefficients of determination in the structural equation model, alcohol expectancy, drinking refusal self-efficacy, and health literacy together accounted for 80% of the variance in the student's alcohol consumption behavior. These theoretically based causal factors provide new directions for future intervention work aimed at modifying the alcohol consumption behaviors of undergraduate students at the Thailand National Sports University. This can be accomplished by developing activities that are suitable and contextually sensitive to their needs.

Keywords: alcohol expectancy, drinking refusal self-efficacy, health literacy, substance abuse, structural equation modeling

1. Introduction

Excessive alcohol consumption causes more than 60 individual diseases, diseases that affect the lives of not only individual consumers, but also their families, friends, communities, and nations, making it a significant public health problem (WHO, 2014). This is especially noticeable in Thailand, where an estimated 52 liters of alcohol are consumed per person per year (WHO, 2014). Moreover, the number of new drinkers is estimated to increase by 250,000 people annually (Center for Alcohol Studies, 2014).

Undergraduate students in Thailand contribute to these negative trends, with 56.8% exhibiting harmful alcohol consumption behaviors (Gilles, Turk, & Fresco, 2005). Within certain geographical locations, the situation may even be worse. For example, Buasorn and Ratchadapunnathiku (2012), who studied the alcohol consumption behavior of undergraduate students in Bangkok, reported that 73.8% exhibited alcohol consumption behaviors up to a hazardous or harmful level. Consuming alcohol at a hazardous level has been shown to increase risk-taking behavior by as much as 25 times in comparison to ordinary undergraduate students (Ham & Hope, 2003; Karam, Kypri, & Salamoun, 2007). Athletes are not immune from this. In a study of 400 athletes at the Thailand National Sports University, Phophan (2009) found that 49.5% of the athletes exhibited alcohol consumption frequencies of daily (3.8%), one–twice per week (27.2%), or three–four times per week (18.5%).

Understanding the contributing factors to undergraduate students' alcohol consumption behaviors is paramount (Kijtorntam, 2012), as this is often the first place that alcohol is consumed (O'Malley & Johnston, 2002). A variety of factors have been considered, including individual, social, and environmental (Hawkins, Catalano, &

Miller, 1992; Petraitis, Flay, & Miller, 1995; Ham & Hope, 2003). While multi-level influences are important, it is also acknowledged that environmental and social factors are subject to changing social dynamics and mores. Furthermore, such factors reside beyond an individual's control and are difficult to change or intervene upon (Glanz, Rimer, & Viswanath, 2015). As such, identifying actionable mechanisms of behavior change at the individual level is important (Ponrachom, Boonchuaythanasit, & Cardinal, 2020).

Toward this end, Ponrachom et al. (2020) identified three relevant variables from their narrative literature review. Namely, alcohol expectancy and drinking refusal self-efficacy (Oei & Morawska, 2004; Oei & Jardim, 2007), and health literacy (Rundle-Thiele, Siemieniako, Kubacki, & Deshapande, 2013; Chisolm, Manganello, Kelleher, & Marshal, 2014; Chang, Miao, Lee, Chen, Chiu, & Lee, 2016). Through the identification of these variables, Ponrachom et al. proposed a new paradigm focused on strengthening individual immunity through empirically supported psychological constructs. While the variables in their model have been individually acknowledged as important, their collective potential in understanding the alcohol consumption behavior of undergraduate students in Thailand is unknown. As a necessary first step in closing this gap, the aim of the present study was to develop a new causal relationship model for the alcohol consumption behavior of undergraduate students in Thailand, and to verify the model's concordance with empirical data.

2. Method

2.1 Participants

Ethical approval to conduct this study was obtained from the Human Research Ethics Committee, Kasetsart University, Bangkok, Thailand (COA No. COA59/003; approved February 2, 2017). All study participants were at least 18 years old and they signed an informed consent form prior to their participation.

On the basis of the criteria of Hair, Black, Babin, Anderson, and Tatham (2006), a representative sample of 1st – 5th year undergraduate students at the Thailand National Sports University were identified ($N = 600$). The two steps in this process were as follows.

Step 1: Thailand was divided into four geographical regions (i.e., Central, Northeastern, Northern, and Southern), with the primary sampling unit within regions being the campuses of the Thailand National Sports University. At each campus the secondary sampling unit was at the Faculty level (i.e., Faculty of Education, Faculty of Liberal Arts, and Faculty of Sport and Health Sciences). From there a tertiary sampling unit was the students' education level (i.e., 1st year, 2nd year, 3rd year, 4th year, and 5th year students).

Step 2: On the basis of this stratification process, representative samples were selected using simple random sampling derived from a table of random numbers.

2.2 Measures

All data were obtained via self-report questionnaire. Three of the questionnaires were previously validated measures, and one was developed and validated specifically for the purposes of this study.

To assess the participants' alcohol consumption behavior, the Alcohol Use Disorder Identification (AUDIT) questionnaire was used (Saunders, Aasland, Babor, de la Fuente, & Grant, 1993). This measure has well-established psychometric properties and has been used in several countries around the world for decades. It has high sensitivity and specificity in diagnosing alcohol consumption.

Permission to use the Alcohol Expectancy Questionnaire from The Comprehensive Effect of Alcohol (CEOA) (Fromme, Stroot, & Kaplan, 1993) and the Drinking Refusal Self-Efficacy Questionnaire (DRSEQ) (Oei & Borrow, 2000) were obtained from the copyright holders. These instruments were further developed in accordance with the tool creation and quality test standards set forth by Maxwell (1996). The Alcohol Expectancy Questionnaire had an overall Cronbach alpha coefficient of .93, and values for each sub-domain ranging from .62-.81, while the DRSEQ had an overall Cronbach alpha coefficient of .95, and values for each sub-domain ranging from .87-.95. All internal reliability coefficients were deemed satisfactory (Ponterotto & Ruckdeschel, 2007).

The final measure used in this study was developed specifically by the researchers for purposes of this research; it was the Health Literacy Questionnaire. The questionnaire attained a content validity index of .78–1.00, was verified by nine experts, and it was quality tested by 60 representative samples from the population using people who were not involved in the study sample. It achieved Cronbach alpha coefficient values ranging from .70-.91, which indicated that this instrument satisfied the required standard of reliability necessary in research (Ponterotto & Ruckdeschel, 2007).

2.3 Procedures

The Faculty at the Thailand National Sports University assisted with data collection at their respective campuses. Participants were asked to complete the questionnaires as distributed. Questionnaires were coded, encrypted, and verified prior to data analysis.

2.4 Analysis

Data were analyzed using descriptive statistics (e.g., mean [M], standard deviation [SD], skewness, and kurtosis) and the causal relationship model's goodness of fit was measured using LISREL 8.80.

3. Results

3.1 Descriptive Summary

The largest majority of students came from the Northern campus (27.5%). They were dispersed across each Faculty as follows: Education (36.3%), Health and Sport Sciences (33.5%), and Liberal Arts (30.2%). Most commonly they were in their 3rd year (31.5%). Their M age was 20.83 ($SD = 1.50$) years, with the majority being males between 18-30 years of age (68.5%). The largest majority had a grade point average between 2.51-3.00 (37.0%).

Half of the participants tried alcohol for the first time when they were between 16-18 years of age ($M = 16.39$, $SD = 2.15$). The top three reasons given for first trying alcohol were trying on their own will (89.3%), friend's incitement (47.3%), or as a challenge (15.8%). The top three alcohol beverages consumed by the participants were beer (92.0%), liquors/red liquors (inclusive of Thai-Foreign brandy) (49.8%), and white liquors/local liquors (34.5%).

The pattern of their alcohol consumption behavior was categorized on the basis of the measurement standard of the World Health Organization (Saunders, Aasland, Babor, de la Fuente, & Grant, 1993). The most common pattern found was hazardous drinking (38.5%), followed by low risk drinking (30.8%), harmful drinking (19.5%), and alcohol dependence (11.2%).

3.2 Preliminary Analysis: Check for Multicollinearity

There were 135 pairs of Pearson's correlation coefficient values. They ranged in size from $-.752$ to $.844$ (all $p < 0.01$), with 64 of those pairs being positive (i.e., ranging from $.290$ to $.844$). The analysis of the correlation coefficients reflects that the observed variables were suitable for inclusion in the structural equation model, as none of the pairs was $>.85$, suggesting that multicollinearity was not a major issue (Kline, 2005).

3.3 Multivariate Analysis: Structural Equation Model

The structural equation model is shown in Figure 1. The model developed was in good agreement with the empirical data ($\chi^2=228.66$, $df = 79$, $p > 0.05$, $\chi^2/df=2.894$, $SRMR = 0.07$, $RMSEA = 0.06$, $CFI = 0.99$, and $RFI = 0.98$), with all computed indices passing the stipulated criteria.

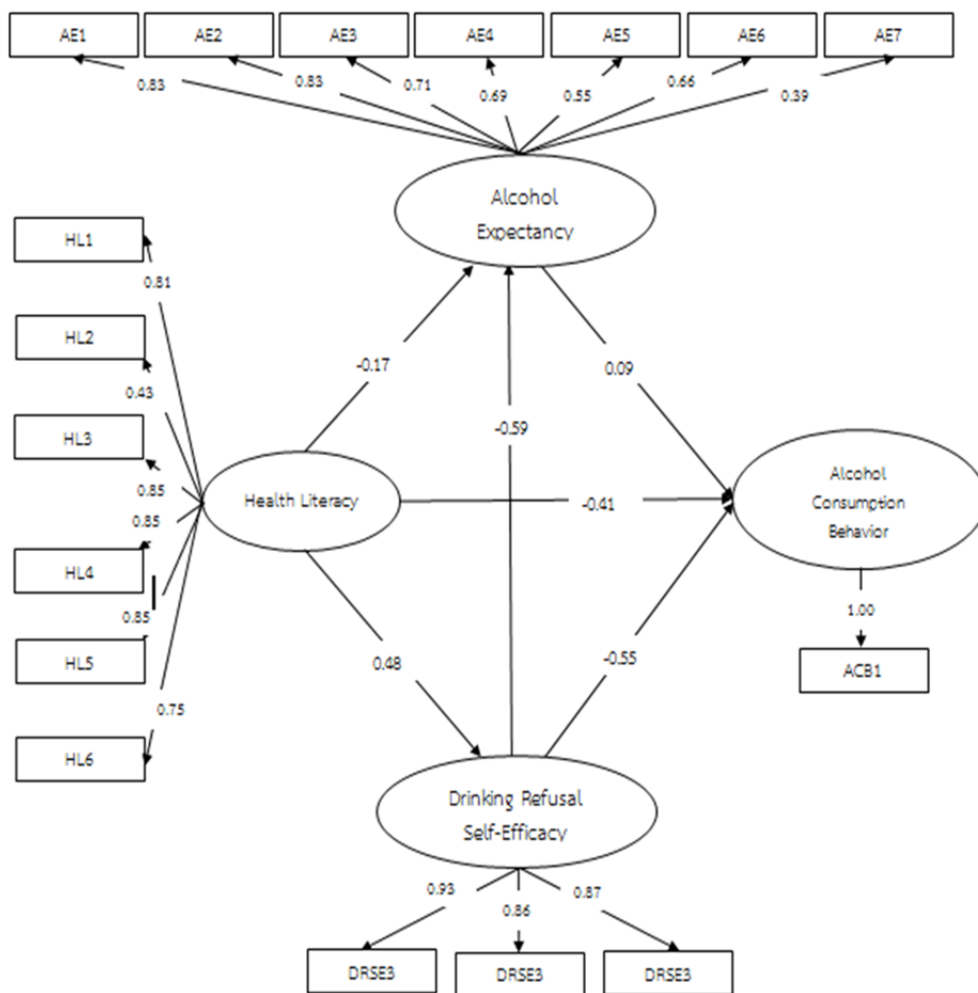


Figure 1. Causal relationship model of alcohol consumption behavior.

As can be seen, alcohol expectancy was directly influenced by drinking refusal self-efficacy, with a path coefficient of -0.59 ($p < 0.05$), and health literacy, with path coefficient of -0.17 ($p < 0.05$). Furthermore, alcohol expectancy was indirectly influenced by health literacy, with a path coefficient of -0.29 ($p < 0.05$).

Looking at alcohol consumption behavior, it was directly influenced by drinking refusal self-efficacy, with a path coefficient of -0.55 ($p < 0.05$), as well as directly influenced by health literacy and alcohol expectancy, with path coefficients of -0.41 and 0.09, respectively (both $p < 0.05$). In addition, alcohol consumption behavior was indirectly influenced by health literacy, with a path coefficient of -0.31 ($p < 0.05$), as well as indirectly influenced by drinking refusal self-efficacy, with a path coefficient of -0.05 ($p < 0.05$).

Finally, drinking refusal self-efficacy was directly influenced by health literacy, with a path coefficient of 0.48 ($p < 0.05$).

Having considered the coefficient of determination from the structural equation model, health literacy described 48% of the variance of drinking refusal self-efficacy, health literacy and drinking refusal self-efficacy together describes 23% of the variance of alcohol consumption behavior, and health literacy, alcohol consumption behavior, and drinking refusal self-efficacy combined described 80% of the variance in alcohol consumption behavior (Table 1).

Table 1. Standard scores of direct influence, indirect influence, and inclusive influence between independent and dependent variables

Independent Variables \ Dependent Variables	Drinking Refusal Self-Efficacy (DRSE)			Alcohol Expectancy (AE)			Alcohol Consumption Behavior (ACB)		
	TE	IE	DE	TE	IE	DE	TE	IE	DE
	Health Literacy (HL)	0.48* (0.05) 0.48	---	0.48* (0.05) 0.48	-0.46* (.004) -0.46	-0.29* (0.04) -0.29	-0.17* (0.04) -0.17	-6.18* (0.42) -0.72	-2.63* (0.26) -0.31
Drinking Refusal Self-Efficacy (DRSE)				-0.59* (0.05) -0.59	---	-0.59* (0.05) -0.59	-5.23* (0.31) -0.60	-0.44* (0.20) -0.05	-4.79* (0.39) -0.55
Alcohol Expectancy (AE)							0.74* (0.35) 0.09	---	0.74* (0.35) 0.09
$\chi^2 (79, n=600) = 228.66, p > 0.05, SRMR = 0.07, RMSEA = 0.06, CFI = 0.99, RFI = 0.98$									
Structural Equation of Variables	DRSE			AE			ACB		
R ²	0.48			0.23			0.80		
Correlation Matrix among Latent Variables									
	HL		DRSE		AE		ACB		
HL	1								
DRSE	0.479		1						
AE	-0.459		-0.677		1				
ACB	-0.716		-0.810		0.650		1		

Remarks: *p < 0.05, TE = Total effect; IE = Indirect effect; DE =Direct effect; Parenthesized figure = Standard Deviation (S.D.); Bolded figure= Standard score.

4. Discussion

In this stratified random sample of 600 undergraduate students at the Thailand National Sports University, 38.5% were drinking alcohol at a hazardous level, 30.8% at a low risk level, 19.5% at a harmful level and another 11.2% were alcohol dependent. Clearly, there is an urgent need for educational and social interventions aimed at mitigating the alcohol consumption behavior of undergraduate students at the Thailand National Sports University. In this study, their alcohol consumption behavior was well explained by three factors: alcohol expectancy, drinking refusal self-efficacy, and health literacy. Health literacy provides a direct negative influence on alcohol consumption behavior, as well as an indirect influence via alcohol expectancy and drinking refusal self-efficacy.

The negative relationship between health literacy and alcohol consumption behavior indicates that undergraduate students with a high level of health literacy exhibited declining levels of alcohol consumption behavior. This was observed in the amount consumed, the frequency of consumption, and the seriousness of alcohol drinking problems. This is an important discovery, as health literacy skills can be taught and learned.

Research outside of Thailand supports the important role that health literacy plays in reducing alcohol consumption (Chang, Miao, Lee, Chen, Chiu, & Lee, 2016; Chisolm, Manganello, Kelleher, & Marshal, 2014; Rundle-Thiele, Siemieniako, Kubacki, & Deshapande, 2013). For example, Chisolm, Manganello, Kelleher, and Marshal (2014) and found an indirect influence via drinking refusal self-efficacy, which was earlier supported by Berkman et al. (2011). With multiple studies across different cultures demonstrating this relationship, it is increasingly clear that health literacy is a crucial educational intervention target (Nutbeam, 2009).

Alcohol expectancy was found to provide a direct positive influence on alcohol consumption behavior. In other

words, the higher the degree of alcohol expectancy the students have, the more alcohol they consume. This is consistent with the findings of others (Chisolm, Manganello, Kelleher, & Marshal, 2014; Gilles, Turk, & Fresco, 2005; Oei & Morawska, 2004).

Drinking refusal self-efficacy provides a direct negative influence on alcohol consumption behavior, meaning that the higher the degree of drinking refusal self-efficacy the students have, the more likely they are to consume less alcohol. Others have also observed this phenomenon (Gilles, Turk, & Fresco, 2005; Oei & Jardim, 2007; Oei & Morawska, 2004). This is because drinking refusal self-efficacy involves the confidence or courage to refuse to consume alcohol across a variety of situations. In addition, drinking refusal self-efficacy also provides an indirect influence on alcohol expectancy, which can help mitigate some of the alcohol expectancy effects.

Like all studies, this study is not without limitations. First, the causal relationships observed and tested in the model were derived from cross-sectional data. Second, all data were self-reported. Self-report data are subject to a variety of biases, such as item interpretation, recall, and social desirability. Third, the data were obtained from undergraduate students from all regions of Thailand; however, they were all part of the multi-campus Thailand National Sports University. As such, the results may not generalize to all university students in Thailand. These limitations should all be kept in mind.

5. Conclusion

While three factors were simultaneously considered in this study, the one that stands out most prominently as an immediately actionable intervention variable is health literacy. Those with higher health literacy drank less alcohol. Moreover, those with higher health literacy score had increased drinking refusal self-efficacy and tempered alcohol expectancies. In other words, they not only drank less, but they were better prepared for a variety of drinking opportunities that might otherwise emerge in their lives (e.g., peer pressure, social setting), and they were more aware and informed about the deleterious effects of alcohol. The new causal relationship model of alcohol consumption behavior developed in this study can be further examined in other institutions and settings. Moreover, the model provides a framework for educational interventions.

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Competing Interests Statement

The authors declare that there are no competing or potential conflicts of interest.

References

- Berkman, N. D., Sheridan, S. L., Donahue, K. E., Halpern, D. J., Viera, A., Crotty, K., ... & Viswanathan, M. (2011). Health literacy intervention and outcome: An updated systematic review. *Evid Rep Technol Assess*, 199, 1-8.
- Buasorn, R., & Ratchadapunnathiku, C. (2012). Alcohol consumption behavior of bachelor degree students in the Bangkok area. *Ramathibodi Nursing Journal*, 18(2), 259-271.
- Center for Alcohol Studies. (2014). *Alcohol situations and the consequences of alcohol consumption in Thailand 2014*. Nonthaburi: The Graphico System Co. Ltd.
- Chisolm, D. J., Manganello, J. A., Kelleher, K. J., & Marshal, M. P. (2014). Health literacy, alcohol expectancies, and alcohol use behaviors in teens. *Patient Educ Couns*, 97(2), 291-296. <https://doi.org/10.1016/j.pec.2014.07.019>
- Chang, F. C., Miao, N. F., Lee, C. M., Chen, P. H., Chiu, C. H., & Lee, S. C. (2016). The association of media exposure and media literacy with adolescent alcohol and tobacco use. *J Health Psychol*, 21(4), 513-525. <https://doi.org/10.1177/1359105314530451>
- Fromme, K., Stroot, E. A., & Kaplan, D. (1993). Comprehensive effect of alcohol: Development and psychometric assessment of a new expectancy questionnaire. *Psychol Assess*, 5, 19-26. <https://doi.org/10.1037/1040-3590.5.1.19>
- Gilles, D. M., Turk, C. L., & Fresco, D. M. (2005). Social anxiety, alcohol expectancies, and self-efficacy as predictors of heavy drinking in college students. *Addict Behav*, 31(3), 388-398. <https://doi.org/10.1016/j.addbeh.2005.05.020>
- Glanz, K., Rimer, B. K., & Viswanath, K. (2015). *Health behavior: Theory, research, and practice* (5th ed.). San

- Francisco, CA: Jossey-Bass.
- Hair, J. F., Black, W. C., Babin, B. J., Anderson, R. E., & Tatham, R. L. (2006). *Multivariate data analysis* (6th ed.). Upper Saddle River, NJ: Pearson Prentice Hall.
- Ham, L. S., & Hope, D. A. (2003). College students and problematic drinking: A review of the literature. *Clin Psychol Rev*, 23(5), 719-759. [https://doi.org/10.1016/S0272-7358\(03\)00071-0](https://doi.org/10.1016/S0272-7358(03)00071-0)
- Hawkins, J. D., Catalano, R. F., & Miller, J. Y. (1992). Risk and protective factors for alcohol and other drug problems in adolescence and early adulthood: Implications for substance abuse prevention. *Psychol Bull*, 112(1), 64-105. <https://doi.org/10.1037/0033-2909.112.1.64>
- Humensky, J. L. (2010). Are adolescents with high socioeconomic status more likely to engage in alcohol and illicit drug use in early adulthood? *Subst Abuse Treat Prev Policy*, 5, 19. <https://doi.org/10.1186/1747-597X-5-19>
- Karam, E., Kypri, K., & Salamoun, M. (2007). Alcohol use among college students: An international perspective. *Curr Opin Psychiatry*, 20(3), 213-221. <https://doi.org/10.1097/YCO.0b013e3280fa836c>
- Kijtorntam, W. (2012). The cause and effect of drinking behavior of Thai undergraduate students. *Journal of Behavioral Science*, 18(2), 16-30.
- Kline, R. B. (2005). *Principles and practice of structural equation modeling*. New York: The Guilford Press.
- Maxwell, B. (1996). Translation and cultural adaptation of the survey instruments. In Martin M. O., Kelly D. L. (Eds.), *Third International Mathematics and Science Study (TIMSS) Technical Report, Volume I: Design and Development*. Chestnut Hill, MA: Boston College.
- Nutbeam, D. (2009). Defining and measuring health literacy: What can we learn from literacy studies? *Int. J. Public Health*, 54, 303-305. <https://doi.org/10.1007/s00038-009-0050-x>
- Oei, T. P. S., & Borrow, T. (2000). Alcohol expectancy and drinking refusal self-efficacy: Test of specificity theory. *Addict Behav*, 25(4), 499-507. [https://doi.org/10.1016/S0306-4603\(99\)00044-1](https://doi.org/10.1016/S0306-4603(99)00044-1)
- Oei, T. P. S., & Jardim, C. L. (2007). Alcohol expectancies, drinking refusal self-efficacy and drinking behaviour in Asian and Australian students. *Drug Alcohol Depend*, 87, 281-287. <https://doi.org/10.1016/j.drugalcdep.2006.08.019>
- Oei, T. P. S., & Morawska, A. (2004). A cognitive model of binge drinking: The influence of alcohol expectancies and drinking refusal self-efficacy. *Addict Behav*, 29, 159-179. [https://doi.org/10.1016/S0306-4603\(03\)00076-5](https://doi.org/10.1016/S0306-4603(03)00076-5)
- O'Malley, P. M., & Johnston, L. D. (2002). Epidemiology of alcohol and other drug use among American college students. *J Stud Alcohol Drugs*, 63 (S14), 23-39. <https://doi.org/10.15288/jsas.2002.s14.23>
- Petraitis, J., Flay, B. R., & Miller, T. Q. (1995). Reviewing theories of adolescent substance use: Organizing pieces in the puzzle. *Psychol Bull*, 117, 67-86. <https://doi.org/10.1037/0033-2909.117.1.67>
- Phophan, P. (2009). *The study of behaviors and factors relating to alcohol drinking on athletes case study: The Institute of Physical Education*. Master thesis, Mahidol University, Thailand.
- Ponrachom, C., Boonchuaythanasit, K., & Cardinal, B. J. (2020). Drinking refusal self-efficacy and alcohol expectancy: changing undergraduate students' alcohol drinking behavior. *Eur j mol clin med*, 7(10), 2915-2921.
- Ponterotto, J. G., & Ruckdeschel, D. E. (2007). An overview of coefficient alpha and a reliability matrix for estimating adequacy of internal consistency coefficients with psychological research measures. *Percept Mot Skills*, 105, 997-1014. <https://doi.org/10.2466/pms.105.3.997-1014>
- Rundle-Thiele, S., Siemieniako, D., Kubacki, K., & Deshapande, S. (2013). Benchmarking alcohol literacy: A multi country study. *Mod. Manag. Rev.*, 20(1), 99-111. https://doi.org/10.1007/978-3-319-50008-9_244
- Saunders, J. B., Aasland, O. G., Babor, T. F., de la Fuente, J. R., & Grant, M. (1993). Development of the Alcohol Use Disorders Screening Test (AUDIT). WHO collaborative project on early detection of persons with harmful alcohol consumption. II. *Addiction*, 88, 791-804. <https://doi.org/10.1111/j.1360-0443.1993.tb02093.x>
- Sharif, I., & Blank, A. E. (2010). Relationship between child health literacy and body mass index in overweight children. *Patient Educ Couns*, 79, 43-48. <https://doi.org/10.1016/j.pec.2009.07.035>

Shone, L. P., King, J. P., Doane, C., Wilson, K. M., & Wolf, M. S. (2011). Misunderstanding and potential unintended misuse of acetaminophen among adolescents and young adults. *J Health Commun, 16*, 256-267. <https://doi.org/10.1080/10810730.2011.604384>

World Health Organization. (2014). *Global status report on alcohol and health 2014*. Geneva: World Health Organization.

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