

## ความรุนแรงที่เกิดจากการบริโภคเครื่องดื่มแอลกอฮอล์ในกลุ่มวัยรุ่นหญิง: การศึกษาแบบภาคตัดขวาง ณ จุดเวลาใดเวลาหนึ่ง

### Alcohol Drinking and Violence-Related Behaviors among Female Youths: A point Cross-Sectional Study

วิศิษฐ์ ฉวีพจน์กำจร<sup>1</sup>, ณัฐจาพร พิชัยณรงค์<sup>2\*</sup>

Wisit Chaveepojnkamjorn<sup>1</sup>, Natchaporn Pichainarong<sup>2\*</sup>

Received: 15 September 2014 ; Accepted: 21 December 2014

#### บทคัดย่อ

การวิจัยแบบภาคตัดขวาง ณ จุดเวลาใดเวลาหนึ่งนี้มีวัตถุประสงค์เพื่อศึกษาความรุนแรงที่เกิดจากการบริโภคเครื่องดื่มแอลกอฮอล์ในกลุ่มวัยรุ่นหญิง จำนวน 6,176 คน ในเขตภาคกลางของประเทศไทย ระหว่างเดือนธันวาคม 2007-กุมภาพันธ์ 2008 จำแนกตามเกณฑ์ โดยเป็นกลุ่มที่บริโภคเครื่องดื่มแอลกอฮอล์เป็นเวลา 30 วันก่อนการวิจัย จำนวน 358 ราย คิดเป็นร้อยละ 5.79 และกลุ่มที่ไม่บริโภคเครื่องดื่มแอลกอฮอล์ จำนวน 5,818 ราย เก็บรวบรวมข้อมูล โดยให้ตอบแบบสอบถามด้วยตนเอง : ซึ่งประกอบด้วย 2 ส่วน ได้แก่ ปัจจัยด้านคุณลักษณะทั่วไปของตัวอย่าง สังคม และพฤติกรรมที่เกี่ยวกับความรุนแรงที่เกิดขึ้นในรอบ 1 ปีที่ผ่านมา คือ พ.ศ. 2549 ผลจากการวิเคราะห์ข้อมูลด้วยสถิติ ถดถอยเชิงพหุ โลจิสติก แบบตัวแปรตาม 2 ระดับ เพื่อควบคุมปัจจัยภายนอก คือ คุณลักษณะทั่วไปและสังคม ผลการศึกษาพบว่า พฤติกรรมความรุนแรงที่เกิดขึ้น เนื่องจากการบริโภคเครื่องดื่มแอลกอฮอล์ในปัจจุบัน 5 ปัจจัย ได้แก่ การพกพาอาวุธ (OR = 2.42, 95 % CI = 1.17-4.98) การถูกล่วงละเมิดจากการนัดหมาย (OR = 2.46, 95 % CI = 1.47-4.14) การถูกบังคับให้มีเพศสัมพันธ์ด้วย (OR = 2.98, 95 % CI = 1.49-5.97) การการรับรู้ความเครียดจนอยากฆ่าตัวตาย (OR = 3.19, 95 % CI = 2.23-4.57) และการวางแผนเพื่อฆ่าตัวตาย (OR = 2.67, 95 % CI = 1.88-3.78) พฤติกรรมเสี่ยงเกี่ยวกับความรุนแรงที่เพิ่มขึ้น พบว่ามีผลต่อสุขภาพเพิ่มมากขึ้นในกลุ่มที่บริโภคเครื่องดื่มแอลกอฮอล์ จากผลการศึกษาบ่งชี้ว่า การป้องกันความรุนแรงที่เกิดขึ้นจากการบริโภคเครื่องดื่มแอลกอฮอล์ของวัยรุ่นหญิงเป็นสิ่งจำเป็นจากการรณรงค์อย่างต่อเนื่อง และการมีการดำเนินงานโดยได้รับความร่วมมือจากผู้ประกอบการ เพื่อนสนิท ครู และพลังในชุมชน เพื่อไม่ให้เกิดความรุนแรงดังกล่าว โดยการลดการบริโภคเครื่องดื่มแอลกอฮอล์ในเยาวชนหญิง

**คำสำคัญ** ; การบริโภคเครื่องดื่มแอลกอฮอล์ พฤติกรรมเกี่ยวกับความรุนแรง วัยรุ่นหญิง

#### Abstract

A point cross-sectional study was conducted to explore alcohol drinking and violence-related behaviors from December 2007 to February 2008 among female youths in central Thailand. Six thousand one hundred and seventy six female students were classified into 2 groups according to their alcohol drinking in the previous 30 days (yes = 358, no = 5,818). Data were collected by an anonymous self-administered questionnaire which consisted of 2 parts: general characteristics and social factors and violence-related behaviors during the last 2006. Of all these respondents 5.79 % admitted to drinking alcohol. Multiple binary logistic regression analysis, after adjusting for general characteristics

<sup>1</sup> ภาควิชาระบาดวิทยา, คณะสาธารณสุขศาสตร์ มหาวิทยาลัยมหิดล กรุงเทพฯ ประเทศไทย

<sup>2</sup> คณะสาธารณสุขศาสตร์ มหาวิทยาลัยมหาสารคาม มหาสารคาม ประเทศไทย

<sup>1</sup> Department of Epidemiology, Faculty of Public Health, Mahidol University, Bangkok, Thailand

<sup>2</sup> Faculty of Public Health, Mahasarakham University, Maha Sarakham, Thailand

\* Correspondence: Natchaporn Pichainarong, Faculty of Public Health, Mahasarakham University, Maha Sarakham, Thailand.

E-mail:natchaporn.p@msu.ac.th

and social factors, revealed that 5 violence-related behavioral factors were associated with current alcohol drinking: often carried a weapon (OR = 2.42, 95 % CI = 1.17–4.98), experience dating violence (OR = 2.46, 95 % CI = 1.47–4.14), ever forced to have sexual relationship (OR = 2.98, 95 % CI = 1.49–5.97) depress for suicide perception (OR = 3.19, 95 % CI = 2.23–4.57), and made a suicide planning (OR = 2.67, 95 % CI = 1.88–3.78). An increased risk of violence-related behaviors was higher among drinking female youths that caused significant health problems. Results indicated that drinking prevention is needed. Continuous campaign mentioning the violence-related behaviors and alcohol drinking and co-operation with their parents, close friends, teachers and community efforts among adolescents should be implemented to prevent underage drinking and other adverse consequences.

**Keywords:** alcohol drinking, violence-related behaviors, female youths

## Introduction

The World Health Organization (WHO) estimates that the worldwide per capita drinking of liquor (person aged  $\geq 15$  years) in 2005 equaled 6.13 litre of pure alcohol while Thai people were 5-7.49<sup>1</sup>. In 2007, the National Statistical Office of Thailand found 8.8 % of Thai female  $\geq 15$  years old drink alcohol. The proportion of female alcohol drinking in the age 25-59 years was 11.2 %, 15-24 years 3.9 % and over 60 years 4.6 %, respectively<sup>2</sup>. It was found that the proportion of female drinkers increased from 8.1 % in 1996 to 14.5 % in 2003, but dropped to 8.8 % in 2007 and gradually increased to 10.8 % in 2009<sup>2,3</sup>. Adolescent drinkers made violence-related problems such as fighting, suicide and homicide and others. Adolescent violence is a serious social issue globally. Violence-related behaviors such as fighting and weapon carrying mostly may lead to serious physical and psychosocial consequences for adolescents.

A rarely found researches into violence-related behaviors and its association with alcohol drinking among female youths in Thailand has been undertaken and a better understanding of them is essential for planning intervention to solve this problem. The aim of this study was to study the associations between current alcohol drinking and other violence-related behaviors among female youths which were revocable beneficiary.

## Materials and Methods

### Study Design and Population

This point cross-sectional study was carried out from December 2007 to February 2008 and it also was a part of the surveillance of drinking behaviors and other

health-risk behaviors among high school females youths in central Thailand (not including Bangkok or its adjacent provinces). The proposal was reviewed and approved by the Ethics Committee for Research in Human Subjects of Mahidol University (Ref.No. Mu 2007-243) and informed consent was sought from parents (with female youths assent). Parental consent and female youths assent were required for participation of the female youths was aged  $<18$  years, whereas the female youths aged  $\geq 18$  years could consent for their own participation. A two-stage stratified sampling technique was used for selecting the 6,176 students from 10 provinces of central Thailand. First stage, these provinces were randomly selected and represented the general characteristics and social of female youths in central Thailand. Second stage, the selection of schools was based on a list of schools obtained from the Provincial Education Offices. All together 6,176 students from Mathayomsuksa School (MS) 1, 3 and 5 participated in the study (equivalent to grade 7, 9 and 11 of an ordinary school). In each school, 3 or less classes of each of these 3 educational levels were recruited of the same grade level. If there were more than three classes, three classes with students of mixed academic performance were randomly selected by their teachers. By virtue of being enrolled in a selected class, all students in the class were eligible to participate. The study subjects were classified into 2 groups according to their alcohol intake in the previous 30 days preceding the survey (yes = 358, no = 5,818). Data were collected using the supervised anonymous self-administered questionnaire which consisted of 2 parts, general characteristics and social, violence-related behaviors and

alcohol drinking behavior was performed by trained health staffs. Current alcohol drinking was defined as drinking at least one standard drink of an alcoholic beverage during the previous 30 days of the survey. A standard drink was defined as a can (330 cc) of beer, a glass (100 cc) of wine, or a small glass (30 cc) of whisky or spirits. The violence-related behaviors during the last 2006 was modified from the questionnaire of the U.S. Youth Risk Behavior Surveillance System<sup>4,5</sup>. The Thai version was translated and verified by a bilingual English university lecturer, and it was reviewed by the experts (composed of psychiatrists, psychologists, nurses, sociologist, school teachers and health promotion specialists). Details of the study including the right to refuse to participate without any effect on their student status were explained and informed consent form was signed from all the participants. The main reason for non-response was absenteeism on the day of the perception survey. Participants self-administered the paper and pencil survey during one class period, taking approximately 30 minutes to complete. Individual answers were kept confidentially.

#### Statistical Analysis

General characteristics and social factors were given as a percentage, crude odds ratio, 95 % CI of OR and p-value. Unadjusted analysis was performed using the Pearson's chi-square test to differentiate proportional exposures between the drinkers and the non-drinkers for categorical variables. A multiple binary logistic regression was used to estimate the adjusted odds ratio and the 95 % CI of OR as associated measurement, and adjustment for confounding variables (age group, educational level, residence, Grade Point Average (GPA), part time job and

family members with alcohol/drug problems) by the enter method. Assessment of the statistical significance of each independent variable was considered at p-value < 0.05. The statistical analysis was performed using SPSS statistical software package (version 18 for windows).

#### Results

There were 358 students (5.79 % of the total sample) who self-identified as current drinkers. Details of the drinking behavior was explained by Chaveepojnkamjorn and Pichainarong, 2009<sup>6</sup>. Of these female youths, the sample age was 15 years old. Most of them were less than 15 years old (40.37 %). Their educational level ranged from 32 % in MS 1 to 37 % in MS 5. The majority of study subjects had a GPA of >3.0 (56.06 %) and 2.0-3.0 (39.77 %). Current drinking prevalence increased with increasing age (3.45 % of < 15 yrs vs 6.52 % of ≥17 yrs) and grade level (3.26 % among 7<sup>th</sup> graders vs 6.98 % among 11<sup>th</sup> graders).

Using univariate analysis, factors significantly associated with alcohol consumption ( $p < 0.05$ ) were age group (OR age 15-16 yrs= 2.49; 95 % CI = 1.89–3.29; OR age ≥17 yrs= 1.95; 95 % CI = 1.45–2.63), educational level (OR MS 3 = 2.22, 95 % CI = 1.62–3.05; OR MS 5 = 2.22, 95 % CI = 1.63-3.02), residence (OR school dormitory = 3.16, 95 % CI = 1.18-7.98; OR private dormitory = 4.49, 95 % CI = 1.25-14.53), GPA (OR GPA <2.0 = 1.59, 95 % CI = 1.01-2.53; OR GPA ≥ 3.0 = 0.67, 95 % CI = 0.53-0.85), having a part time job (OR = 1.39, 95 % CI = 1.07-1.79) and having family members with alcohol/drug problems (OR = 1.82, 95 % CI = 1.45-2.30) (Table 1).

**Table 1** Unadjusted association between general characteristics and social factors and current drinking of female youths

Variables	No.drinker/total	%drinker	Crude OR	95%CI	p-value <sup>a</sup>
Age group (yrs) (n = 6176)					
< 15	86/2493	3.45	1		
15-16	158/1934	8.17	2.49	1.89-3.29	< 0.001 <sup>a</sup>
≥17	114/1749	6.52	1.95	1.45-2.63	< 0.001 <sup>a</sup>
Mean (SD)	14.91 (1.77)				
Median (QD)	15.00 (2.00)				
Min-Max	11-21				
Educational level (n = 6176)					
MS 1	64/1964	3.26	1		
MS 3	134/1921	6.98	2.22	1.62-3.05	<0.001 <sup>a</sup>
MS 5	160/2291	6.98	2.22	1.63-3.02	<0.001 <sup>a</sup>
Religion (n = 6158)					
Buddhist	351/6051	5.80	1		
Islam	4/44	9.09	1.62	0.49-4.75	0.332 <sup>b</sup>
Others	1/63	1.59	0.26	0.01-1.94	0.267 <sup>b</sup>
Residence (n = 5559)					
House/Apartment of family	307/5502	5.58	1		
School dormitory	6/38	15.79	3.16	1.18-7.98	0.006 <sup>b</sup>
Private dormitory	4/19	21.05	4.49	1.25-14.53	0.004 <sup>b</sup>
Cohabitant (n = 5931)					
Parent	286/5049	5.66	1		
Relative	52/819	6.35	1.13	0.82-1.54	0.435 <sup>a</sup>
Friend	3/30	10.00	1.85	0.44-6.40	0.242 <sup>b</sup>
Alone	2/32	6.25	1.11	0.26-4.67	0.703 <sup>b</sup>
Grade point average (n = 5371)					
<2.0	25/224	11.16	1.59	1.01-2.53	0.040 <sup>a</sup>
2.0-3.0	158/2136	7.40	1		
>3.0	154/3011	5.11	0.67	0.53-0.85	<0.001 <sup>a</sup>
Mean (SD)	3.08 (0.59)				
Median (QD)	3.11 (0.44)				
Min-Max	1.00-4.00				
Part time job (n = 6087)					
No	266/4896	5.43	1		
Yes	88/1191	7.39	1.39	1.07-1.79	0.009 <sup>a</sup>
Family members with alcohol/drug problems (n = 5561)					
No	143/3165	4.52	1		
Yes	190/2396	7.93	1.82	1.45-2.30	<0.001 <sup>a</sup>

<sup>a</sup> Pearson's chi-square test, <sup>b</sup> Fisher's exact test, OR = odds ratio, CI = confidence interval.

MS 1 = 1<sup>st</sup> year of secondary school (equivalent to 7<sup>th</sup> grader), MS 3 = 3<sup>rd</sup> year of secondary school (equivalent to 9<sup>th</sup> grader), MS 5 = 5<sup>th</sup> year of secondary school (equivalent to 11<sup>th</sup> grader).

The multivariate analyses showed only 5 violence-related behaviors that after adjustment (age, educational level, residence, GPA, having a part time job, and having family members with alcohol/drug problems), compared with non-drinkers, current drinkers were more likely to carry a weapon (OR = 2.42, 95 % CI = 1.17–4.98), experience dating violence (OR = 2.46, 95 % CI = 1.47–4.14) and ever forced to have sexual relationship

(OR = 2.98, 95 % CI = 1.49–5.97), were still associated with higher odds ratio among current drinkers than non-drinkers. In addition, perception of sad and attempted suicide, indicated that participants had depress for suicide perception (OR = 3.19, 95 % CI = 2.23–4.57) and making a suicide planning (OR = 2.67, 95 % CI = 1.88–3.78) were also significantly associated with current drinking, as shown in Table 2.

**Table 2** Percent, crude OR and adjusted OR of violence-related behaviors among female youths according to drinking status.

Violence-related behaviors	All Respondents (n = 6176)	Nondrinkers (n = 5818)		Current drinkers (n = 358)			
	Current drinkers	%	%	Crude OR	Adjusted OR <sup>a</sup>	95% CI	
(n = 358)	1.36	1.25	3.21	2.62	2.42	1.17-4.98	0.017
Often got into a physical fight without injury	0.96	0.91	1.76	1.96	2.28	0.87-5.95	0.093
Dating violence	5.21	4.48	11.45	2.76	2.46	1.47-4.14	0.001
Ever forced to have sexual relationship	4.69	3.74	11.35	3.29	2.98	1.49-5.97	0.002
Depress for suicide perception	4.59	3.99	14.57	4.11	3.19	2.23-4.57	<0.001
Made a suicide perceived plan	5.53	4.92	15.54	3.56	2.67	1.88-3.78	<0.001

<sup>a</sup> Adjusted for age group, educational level, residence, GPA, part time job and family members with alcohol/drug problem

## Discussion

Our findings demonstrated that approximately 6 % of female youths reported that they drank alcohol at least one drink during the 30 days preceding the survey. This result may be an underestimate among these girls. One of the reasons may be that they were afraid of punitive consequences from their parents or caregivers, despite of the fact that they had been assured that personalized information would not be reported<sup>6</sup>. Adolescence is a vulnerable period and facilitates the start of risk behaviors, for instance consuming alcohol, cigarette smoking and other substance use etc. This study confirmed that older girls drank more than the younger ones<sup>7-9</sup>. In aspect of violence-related behaviors, current drinkers are at higher risk of often carrying a weapon,<sup>10-12</sup> dating violence<sup>13-18</sup> and being ever forced to have sexual relationship<sup>19</sup>. In addition, drinkers are at higher risk perceived of seriously thinking about suicide and making a plan how they would attempt suicide. This

corresponds with the results of the previous studies<sup>19,20</sup>. These behaviors may lead to fighting and injury, unwanted pregnancy, unwanted child and illegal abortion. This study was subject to a few limitations. First, the present study was a point cross-sectional survey, it was difficult to make statements about cause and effect relationships between alcohol drinking and the violence-related behaviors. Second, these data apply only to female youths who attend high school and, therefore, are not representative of all female youths. Moreover, the data collection in the classroom might exclude students who are often absent from class or those who developed serious alcohol-related problems and dropped out of school<sup>21</sup>. Finally, all data were based on student self-reporting, which may lead to variation in the number of standard drinks consumed<sup>22, 23</sup> and other violence-related behaviors.

This study showed the association between the violence-related behaviors and alcohol drinking among female youths. Therefore the ways to reduce underage

drinking should be performed. The effective intervention strategies such as limiting youth access (namely, adequate enforcement of the minimal legal drinking age, increased alcohol taxes, reduced exposure to alcohol advertising and marketing, implementation of comprehensive community-based programs to prevent drinking, development of a national media campaign to reduce risky drinking etc.) to alcohol has reduced underage alcohol drinking and alcohol-related problems<sup>24,25</sup>. Family institution and friend are the first place to promote immunity against alcoholic drinks/drug use. Because adolescents trust and copy their friend believes, family love and warmth in adolescents are necessary for children's adjustment when they have any problems and necessary for emotional development, including being the good role-model for good practice. Not only family roles but also good girls model could be done. Poor parental supervision, family dissolution, and negative peer influence have all been shown to be associated with violence<sup>26-28</sup>. In addition, a policy for the development of prevention programs aimed to prevent/reduce alcohol use and integrate the programs into the curriculum in formal education should be initiated. Moreover, a policy advocating for safety environments in multiple settings against alcohol use, such as seriously strict enforcement of selling liquor, prohibiting alcohol sales near schools, and increasing alcohol taxes to their maximum levels, should be promoted<sup>24,25,29</sup>. Applications of the health promoting school model of WHO<sup>30</sup> should be utilized to develop the effective school health programs to relieve these problems. Some papers showing the effectiveness of Health Promoting School in minimizing health-risk behaviors<sup>24, 31,32</sup>. These measures could go a long way in not only reducing the numbers of violators but also make a positive overall contribution to public health. However underage drinking cannot be successful by focusing on adolescents alone, the efforts strongly need to focus on youths, their close friends, family, teachers and adults.

### Acknowledgement

The authors wish to express sincerely thanks for their valuable participation in the study given by the high

school students and the practical support of the health staffs and the staff of the participating high schools. We also thank those who are not mentioned for their kindness and encouragement. This work was a part of the surveillance of drinking behaviors and other health-risk behaviors among high school students in Thailand and was supported by a grant from the Center for Alcohol Studies (CAS), Thailand and was partly supported by the China Medical Board (CMB) Faculty of Public Health, Mahidol University, Bangkok, Thailand.

### References

1. World Health Organization. Global status report on alcohol and health. Geneva: World Health Organization. 2011.
2. National Statistical Office. The cigarette smoking and alcoholic drinking behaviour survey 2007. Bangkok: Statistical forecasting bureau. 2008.
3. Bureau of Policy and Strategy. Ministry of Public Health. Thailand Health Profile 2008- 2010. Bangkok: the War Veterans Organization of Thailand. 2011.
4. Brener ND, Hann L, Kinchen SA, et al. Methodology of the youth risk behavior surveillance system. *MMWR* 2004; 53: 1-13.
5. Centers for Disease Control and Prevention (CDC). Youth risk behavior surveillance—United States, 2007. *Morb Mortal Wkly Rep* 2008; 57: 1–31.
6. Chaveepojnkamjorn W, Pichainarong N. Drinking behavior among female high school students in central Thailand. *J Med Assoc Thai* 2009; 92 (Suppl 7): s1-7.
7. Miller JW, Naimi TS, Brewer RD, Jones SE. Binge drinking and associated health risk behavior among high school students. *Pediatrics* 2007; 119: 76-85.
8. Johnston LD, O'Malley PM, Bachman JG, Schulenberg JE. Monitoring the future, National results on Adolescent Drug Use: Overview of Key Finding, 2007. Bethesda, MD: National Institute on Drug Abuse, 2008. (NIH Publication No. 08-6418)
9. Chaveepojnkamjorn W, Pichainarong N. Factors associated with alcohol consumption among upper secondary school students. *Southeast Asian J Trop*

- Med Public Health 2007; 38: 146-51.
10. Domingues SC, Mendonca JB, Laranjeira R, Nakamura-Palacios EM. Drinking and driving: a decrease in executive frontal functions in young drivers with high blood alcohol concentration. *Alcohol* 2009; 43: 657-64.
  11. Eaton DK, Kann L, Kinchen S, et al. Youth risk behavior surveillance-United States, 2007. *MMWR* 2008; 57: 1-131.
  12. Strauch E S, Pinheiro RT, Silva R A, Horta BL. Alcohol use among adolescents: a population-based study. *Rev Saude Publica* 2009; 43: 647-55.
  13. Clubb PA, Browne DC, Humphrey AD, Schoenbach V, Meyer B, Jackson M, the RSVPP Steering Committee. Violent behaviors in early adolescent minority youth: results from a "middle school youth risk behaviors survey". *Maternal Child Health J* 2001; 5: 225-35.
  14. DuRant RH, Krowchuk DP, Kreiter S, Sinal SH, Woods CR. Weapon carrying on school property among middle school students. *Arch Pediatr Adolesc Med* 1999; 153: 21-6.
  15. Peskin MF, Tortolero SR, Addy RC, Weller NF. Weapon carrying prevention should adults spend more time with youth? *Youth Violence Juv Justice* 2009; 7: 32-45.
  16. Kreiter SR, Krowchuk DP, Woods CR, Sinal SH, Lawless MR, DuRant RH. Gender differences in risk behaviors among adolescents who experience date fighting. *Pediatrics* 1999; 104: 1286-92.
  17. Champion H, Foley KL, Sigmon-Smith K, Sutfin EL, DuRant RH. Contextual factors and health risk behaviors associated with date fighting among high school students. *Women Health* 2008; 47: 1-22.
  18. Ramisetty-Mikler S, Goebert D, Nishimura S, Caetano R. Dating violence victimization: associated drinking and sexual risk behavior of Asian, native Hawaiian, and caucasian high school students in Hawaii. *J Sch Health* 2006; 76: 423-9.
  19. Basile KC, Black MC, Simon TR, Arias I, Brener ND, Saltzman LE. The association between self-reported lifetime history of forced sexual intercourse and recent health-risk behaviors: findings from the 2003 National Youth Risk Behavior Survey. *J Adolesc Health* 2006; 39: 752 e 1-7.
  20. Kirkcaldy BD, Siefen GR, Urkin J, Merrick J. Risk factors for suicidal behavior in adolescents. *Minerva Pediatr* 2006; 58: 443-50.
  21. Sanchez ZM, Martins SS, Opaleye ES, et al. Social factors associated to binge drinking: a cross-sectional survey among Brazilian students in private high schools. *BMC Public Health* 2011; 11: 201.
  22. Kraus CL, Salazar NC, Mitchell JR, Florin WD, Guenther B, Brady D, Swartzwelder HS, White AM. Inconsistencies between actual and estimated blood alcohol concentrations in a field study of college students: do students really know how much they drink? *Alcohol Clin Exp Res* 2005; 29: 1672-6.
  23. White AM, Kraus CL, Flom JD, Kestenbaum LA, Mitchell JR, Shah K, Swartzwelder HS. College students lack knowledge of standard drink volumes: implications for definitions of risky drinking based on survey data. *Alcohol Clin Exp Res* 2005; 29: 631-8.
  24. Wong MC, Sun J, Lee A, et al. The impact of a newly designed resilience-enhancing programme on parent- and teacher-perceived resilience environment among Health Promoting Schools in Hong Kong. *J Epidemiol Community Health* 2009; 63: 209-14.
  25. Xin-Wei Z, Li-Qun L, Xue-Hai Z, et al. Health-promoting school development in Zhejiang Province, China. *Health Promot Int* 2008; 23: 220-30.
  26. Hawkins JD, Herrenkohl TI, Farrington DP, Brewer D, Catalano RF, Harachi TW, et al. Predictors of youth violence. *Juvenile Justice Bulletin* 2000. Available at : [https://www.ncjrs.gov/html/ojjdp/jjbul2000\\_04\\_5/contents.html](https://www.ncjrs.gov/html/ojjdp/jjbul2000_04_5/contents.html). Accessed 5 November 2012.
  27. Singer MI, Miller DB, Guo S, Flannery DJ, Frierson T, Slovak K. Contributors to violent behavior among elementary and middle school children. *Pediatrics* 1999; 104: 878-84.
  28. Borowsky IW, Ireland M. Predictors of future fight-related injury among adolescents. *Pediatrics* 2004; 113: 530-6.

29. Lee A, Wong MC, Keung VM, Yuen HS, Cheng F, Mok JS. Can the concept of Health Promoting Schools help to improve students' health knowledge and practices to combat the challenge of communicable diseases: Case study in Hong Kong? *BMC Public Health* 2008; 8: 42.
30. World Health Organization. School and Youth Health. [Cited 2012 Oct 8]. Available from URL: [http://www.who.int/school\\_youth\\_health/gshi/hps/en/index.html](http://www.who.int/school_youth_health/gshi/hps/en/index.html).
31. Inchley J, Muldoon J, Currie C. Becoming a health promoting school: evaluating the process of effective implementation in Scotland. *Health Promot Int* 2007; 22: 65-71.
32. Lee A, Cheng FF, Fung Y, St Leger L. Can Health Promoting Schools contribute to the better health and well-being of young people? The Hong Kong experience. *J Epidemiol Community Health* 2006; 60: 530-6.