

Original Research

Alcohol Consumption Patterns and Associated Risk Behaviors in Three Ethnic Groups of Malaysian Millennials

Sangeeta K. Singh, PhD^{1*}; Kwong H. Yap, PhD²; Peter Natarajan, (Medical Degree)¹; Pascale Allotey, PhD³; Daniel Reidpath, PhD²

¹Perdana University-Royal College of Surgeons in Ireland School of Medicine, Serdang 43400, Selangor, Malaysia

²Monash University Malaysia, Jalan Lagoon Selatan, Bandar Sunway, Subang Jaya 47500, Selangor, Malaysia

³International Institute for Global Public Health, United Nations University (UNU), UKM Medical Center, Jalan Yaacob Latif, Bandar Tun Razak, Cheras 56000, Kuala Lumpur, Malaysia

*Corresponding author

Sangeeta K. Singh, PhD

Senior Lecturer, Perdana University-Royal College of Surgeons in Ireland School of Medicine, Serdang 43400, Selangor, Malaysia; Tel. +603 89418646, ext 182; Fax. +603 89417661; E-mail: sangeetakaur.sran@gmail.com

Article information

Received: March 19th, 2020; Revised: April 4th, 2020; Accepted: April 8th, 2020; Published: April 24th, 2020

Cite this article

Singh KS, Yap KH, Natarajan P, Allotey P, Reidpath DD. Alcohol consumption patterns and associated risk behaviors in three ethnic groups of Malaysian millennials. *Public Health Open J.* 2020; 5(2): 26-32. doi: [10.17140/PHOJ-5-144](https://doi.org/10.17140/PHOJ-5-144)

ABSTRACT

Objectives

To gain further insights into factors associated with harmful alcohol consumption patterns and other associated behaviours among Malaysians millennials.

Methods

The United States Centre for Disease, Control, and Prevention (CDC) Youth Risk Behaviour Survey was adapted and translated into Bahasa Malaysia language. The self-administered questionnaire collected information on socio-demographic characteristics and risk behaviours associated with alcohol consumption. Multi-facet sampling was used to recruit participants across six sites in the Klang Valley, Malaysia. There were 326 respondents: 103 Malays, 111 Chinese and 112 Indians; with 171 (52%) male and 155 (48%) female.

Results

Mean age of the respondents was 21-years. Twenty percent of the millennials surveyed were binge consumers: 79% of binge drinkers were male. More than half (54%) of the binge drinkers were Indians followed by Chinese at 39% and Malays at 8%. Binge consumers were at increased odds (OR=7.58: 95% CI=3.88-14.80) of driving a vehicle under the influence of alcohol and at increased odds (OR=6.88: 95% CI=3.40-13.90) of being driven by someone drunk. Those who were binge drinkers were also at higher odds than non-drinkers of being forced into sexual intercourse (OR=3.16: 95% CI=1.25-7.97) or other sexual acts (OR=3.84: 95% CI=1.74-8.47). Binge drinkers were also more prone to smoking compared to current drinkers (OR=10.82 9% CI=4.85-24.12).

Conclusion

Binge consumption among millennials was associated with a myriad of behavioural risk factors and harmful alcohol-related consequences. Multiple strategic approaches are needed that address respective cultural norms, enhancement of millennials socialisation and engagement skills within communities to improve the efficacy of preventive interventions.

Keywords

Alcohol; Communities; Malaysia; Risky behaviours; Social; Youth.

INTRODUCTION

In the Asia-Pacific region, Malaysia, like Indonesia, generally reports a lower level of alcohol consumption patterns i.e., 0.8 and 0.6 litres per person respectively. These patterns are much lower when its compared to India (3.6 litres), Singapore (1.0 litres) and Thailand (6.8 litres) per person.¹ Such a low-level of alcohol

consumption is noted because Malaysia is a majority Muslim country. Malaysia's multiracial population comprises of Malay-Muslim (68.8%), Chinese (23.2%), Indians (7%) and others (1%). However, when lifetime abstinence in Malaysia was compared with other Muslim countries, Malaysia had the lowest levels of lifetime abstainers (81.7%) compared with Bangladesh (93.6%) and Indonesia (84.3%).² Also, local newspapers and researchers are

suggesting that Malaysia was the tenth largest alcohol consumer in the world.³⁻⁶ The prevalence of alcohol consumption in the general population ranges from 2 to 5%. The prevalence of binge drinking in Malaysia among the general population is at 6%, which is again low when compared to the global prevalence.⁷ However, a recent study reported that 50% of current consumers are also binge drinkers (drinking more than 4 units for females and more than 5 units for males in about two hours). Moreover, the number of binge consumers had doubled since 2006.⁷

Global evidence has indicated that binge consumption patterns are closely associated with riskier behavioural patterns and these forms of risk behaviours are prominent in both young male and female adults.⁸⁻¹² Several forms of risk behaviours while under the influence include: riding in or driving a motor vehicle, entering into physical altercations, injury due to physical fights and forced sexual intercourse.^{8,13}

While there is some local, Malaysian, evidence which reports on the Millennials' alcohol consumption and their alcohol-related behaviours, there are significant shortcomings in these studies. Except for Manickam et al, all the studies relied on large government surveys and did not focus on millennials.¹⁴ In an environment where it is illegal for the majority Muslim population to consume alcohol, such reports almost certainly carry a bias. For example, Cheah in 2015, explicitly excluded Malay-Muslims from his study analyses, upwardly biasing any population estimates, and further affecting a complete understanding of such behaviours.¹⁵ Studies including Malay-Muslims are conversely likely to downward bias any estimates. As a consequence, there is a general belief amongst the government, health practitioners, local researchers, and the general public that alcohol consumption patterns are predominantly exhibited by the Chinese and Indians, and there is little understanding of patterns amongst the Malay-Muslims.^{3,4,16}

Among the limited Malaysian research that did look at Millennials alcohol consumption patterns, the studies were mainly centred around school-based, student health surveys.¹⁴ Manickam's study on adolescents between 12 to 17-years of age in school settings concluded that alcohol consumption prevalence within this age group was at 9%. Like other local studies, Manickam also cautioned that alcohol consumption amongst Malay-Muslim respondents could suffer from a self-reporting bias. Thus, keeping the social sanctions on alcohol use in mind, underreporting is expected. Besides, school-based surveys in Malaysia are conducted almost exclusively in government schools – once again limiting the understanding of harmful consumption patterns amongst a more extensive selection of local Millennials.¹⁷⁻¹⁹ These important gaps are promoting a zero tolerance or abstinence approach. Such limitations are impacting streamlining of strategies on how to improve evidence-based screening or intervention policies.^{20,21}

To address the shortcomings in local studies, there is a need to develop an evidence base that draws on community-based studies of Millennials and alcohol use which could inform the design and implementation of targeted intervention.²²⁻²⁵ It is hoped that understanding alcohol consumption patterns in differ-

ent neighbourhoods, especially among specific ethnic groups who consume at a harmful level will guide future management and intervention strategies that could aid people at risk.²⁶⁻²⁸ Therefore, this study aims to obtain further insights into neighbourhood patterns of harmful alcohol consumption and other associated behaviours among young Malaysian adults.

METHODS

For this study, patterns of unhealthy alcohol consumption were explored with an adaptation of the Youth Risk Behaviour Survey [YRBS] developed by the Centres for Disease Control, and Prevention (CDC).²⁹ The YRBS is primarily designed to monitor priority health-risk behaviours among youth and was used in Malaysian schools study in 2007 and 2011.^{30,31}

The questionnaire contained 41 questions that assessed socio-demographics [q 1-6], actions resulting in unintentional injuries [q 7,8], behaviours resulting in violence [q 9-13], tobacco use [q 14-19], electronic vape use [q 20,21] and alcohol use [q 22-27].

Sampling

In the first stage of the study, ethnographic mapping was used to identify six localities in five sites within the Klang Valley utilizing data from the Population and Housing Census of Malaysia 2010. The selection was based on categorizations of urban/semi-urban areas and the density of each ethnic group. Areas with a population density of an identified ethnic group below 5,000 were considered semi-urban, while a density of more than 5,000 was considered urban. The five selected areas were: Setapak (urban for Malays), Cheras (semi-urban for Malays and Chinese), Petaling Jaya (urban for Chinese), Batu (urban for Indians), and Ampang (semi-urban for Indians). Once the areas are categorised, six ethnic residential sites were mapped out to identify places where Millennials congregated and socialized with each other. Mapping commenced in 2014 and data were obtained in 2015 *via* a self-administered questionnaire.

Multi-facet sampling was applied to identify study participants in each locality. Initially, probability sampling was used to identify the participants of a required ethnic group. Followed by convenience sampling which categorised participants by age and gender. Identified individuals were invited to complete a self-administered questionnaire. Inclusion criteria were: i) belong to the age group 18-25-years, and ii) able to speak and read English or Bahasa Malaysia. Exclusion criteria were: i) refusing to give informed consent, or ii) severe medical problems preventing participation (visible mental or physical health which may hinder participation was considered an exclusion criterion).

A sample of 326 participants was identified and used to estimate the proportion of risk from drinking with a margin of error of 5.38% and a confidence interval of 95%. The current population prevalence of drinking was 47.5% and the overall response rate was 52.5%. The response rate is further discussed as a limitation of the study.

Measures

Population characteristics: The baseline characteristics collected in this study included gender, age, ethnicity and highest education level. Female was the reference category for gender. Age was grouped into the categories 18-19 (reference category), 20-22 and 23-25. Ethnicity was categorised as Malay (reference category), Chinese and Indian.

Risk behaviours: Risk behaviours which included questions on smoking and behaviours which may result in unintended pregnancies, sexually transmitted diseases (STD) and contribute to unintentional injuries and violence were assessed in the survey. The association between binge drinking and the following variables were evaluated:

Smoking: I“*During the past 30-days, how many days did you smoke cigarettes?*” Participants who reported that they had smoked cigarettes at least once a day during the past 30-days before completing the survey were labelled as smokers. Non-smokers were the reference group.

Driven by someone who has consumed alcohol: “*During the past 30-days, how many times did you ride in a car or another vehicle driven by someone who had been drinking alcohol?*” Those who responded at least one time were categorized as “Yes”.

Drove a vehicle while under the influence: “*During the past 30 days, how many times did you drive a car or enter another vehicle when you had been drinking alcohol?*” Those who responded at least one time were categorized as “Yes”.

Physical fight: “*During the past 12-months, how many times were you involved in a physical fight?*” Those who responded at least one time were categorized as “Yes”.

Injured in a physical fight: “*During the past 12-months, how many times were you involved in a physical fight in which you were injured and had to be treated by a doctor or nurse?*” Those who responded at least one time were categorized as “Yes”.

Experience physical pain in a relationship: “*During the past 12-months, how many times did someone whom you dated or go out with physically hurt you on purpose (count such things as being hit, slammed into something, or injured with an object or weapon).*” Those who responded at least one time were categorized as “Yes”.

Forced sexual intercourse: “*Have you ever been forced to have sexual intercourse when you did not want to?*” Those who responded at least one time were categorized as “Yes”.

Forced sexual acts: “*During the past 12-months, how many times did someone whom you dated or go out with force you to do sexual acts that you did not want to do (count such things as kissing, touching, or being physically forced to have sexual intercourse).*” Those who responded at least one time were categorized as “Yes”.

Several risky behaviours: The risky behaviours for each participant were added up to derive the total number of risky behaviours per participant. This was grouped into 1 or less risky behaviours (reference group), 2 to 3 risky behaviours and 4 or more risky behaviours.

Binge Drinking

In this study, alcohol consumption was categorized into three patterns of drinking: ever-drinker, current drinker and binge drinker. Ever-drinker was defined as those who reported having had at least one alcoholic drink over their lifetime — not inclusive of current and binge drinkers. Current drinker was defined as those who had consumed at least one alcoholic drink over the past 30-days before completing the survey — not inclusive of the binge drinker. Binge drinker was defined as those who had consumed five or more alcoholic drinks over a couple of hours in the last 30-days before completing the survey.

Statistical Analysis

Data were analysed using Statistical Package for Social Sciences, version 22 (SPSS® IBM, NY, USA). Differences in baseline characteristics of the study population were compared using the χ^2 test for categorical variables. Significant variables were then included in the subsequent multivariate regression models using direct entry. Multivariable logistic regression analyses, controlling for gender and ethnicity were used to determine the association between binge drinking and the individual's risky behaviours in separate models. Missing data in risky behaviour categories were excluded and were not included when estimating the relationship with binge drinking in the respective adjusted models.

RESULTS

Sociodemographic and outcome variables were complete for 326 respondents. Missing data was at the maximum of seven cases (for the pooled risky behaviour variable) which is about 2% of the sample. For the individual risky behaviours, missing data ranged from one case to a maximum of four cases (Table 1) which is 0.3% to 1.2% of the data.

Of 326 respondents, 171 were males (52%) and 155 were females (48%). There were 155 participants who have consumed alcohol; out of which 49 (15%) were categorised as ever drinkers, 41 (12.6%) current drinkers and 65 (19.9%) binge drinkers. However, the focus of the following results will be based on those who are binge drinkers. There were no differences in the proportion of binge drinkers by age group or educational level. Most of the binge drinkers were male (78.5%, n=51). Out of 20% of the binge consumers, 45 of them were consuming an average of 7.5 drinks over an hour. Beer was the preferred beverage. Based on the United Kingdom's definition, a beer contains up to two units of alcohol. On this basis, the participants were consuming an average of 14 units over an hour. Out of the 45 binge consumers, ten were binge drinking at least twice in a month. Thirteen binge consumers had similar drinking patterns of at least 3 to 5 times in a month; followed by eleven binge drinkers who consumed at least

6-9 times in a month. Two binge consumers drank 10-19 times and nine of them binge drank more than 20 times in the past month. Binge patterns varied by ethnic group. Indians made up 53.8% (n=35) of binge drinkers followed by Chinese at 38.5% (n=25)

and Malays at 7.7% (n=5).

The differences in proportions between non-binge and binge drinkers for all the risky behaviours examined in this

Table 1. Participant Demographic Characteristics

	Total (n=326)		Not Binge (N=261)		Binge (n=65)		p-value
	n	%	n	%	n	%	
Age							0.764
18-19	128	39.3	105	40.2	23	35.4	
20-22	130	39.9	102	39.1	28	43.1	
23-25	68	20.8	54	20.7	14	21.5	
Current Education							0.12
High school, foundation, cert	70	21.5	62	23.8	8	12.3	
Diploma	109	33.4	81	31.0	28	43.1	
Degree, master, graduate, Phd	94	28.8	74	28.4	20	30.8	
did not answer (other's, missing)	53	16.3	44	16.9	9	13.8	
Ethnicity							<0.001
Malay	103	31.6	98	37.5	5	7.7	
Chinese	111	34.0	86	33.0	25	38.5	
Indian	112	34.4	77	29.5	35	53.8	
Gender							<0.001
M	171	52.5	120	46.0	51	78.5	
F	155	47.5	141	54.0	14	21.5	
Driven by someone who has consumed alcohol (n=324)							<0.001
No	230	71.0	212	81.2	18	28.6	
Yes	94	29.0	49	18.8	45	71.4	
Drove a vehicle while under the influence (n=323)							<0.001
Denatured alcohol	268	83.0	238	91.5	30	47.6	
Iodine tincture	55	17.0	22	8.5	33	52.4	
Physical fight (n=325)							<0.001
No	255	78.5	216	82.8	39	60.9	
Yes	70	21.5	45	17.2	25	39.1	
Injured in a physical fight (n=324)							0.015
No	294	90.7	241	92.7	53	82.8	
Yes	30	9.3	19	7.3	11	17.2	
Forced sexual intercourse (n=321)							<0.001
No	295	91.9	245	95.0	50	79.4	
Yes	26	8.1	13	5.0	13	20.6	
Experience physical pain in a relationship (n=325)							<0.001
No	293	90.2	243	93.1	50	78.1	
Yes	32	9.8	18	6.9	14	21.9	
Forced sexual acts (n=324)							<0.001
No	281	86.7	236	90.8	45	70.3	
Yes	43	13.3	24	9.2	19	29.7	
Smoking (n=326)							<0.001
No	230	70.6	207	79.3	23	35.4	
Yes	96	29.5	54	20.7	42	64.6	
Number of risky behaviours (n=319)							<0.001
1 or less	148	46.4	142	55.0	6	9.8	
2 to 3	116	36.4	91	35.3	25	41.0	
4 and above	55	17.2	25	9.7	30	49.2	

survey were statistically significant. The highest (71.4%, n=45) proportion of risky behaviour was found among binge drinkers who were passengers in a car or other vehicles driven by someone who had been drinking alcohol compared to just 18.8% (n=49) of the non-bingers. Of binge drinkers, 52.4% (n=33) had driven a car after consumption compared to only 8.5% (n=22) of non-bingers. Concerning physical violence, 39% of binge drinkers were involved in physical fights, of which 17.2% (n=11) of these binge drinkers reported injuries attained from fights. Also, 21.9% (n=14) of the binge drinkers had dated and were harmed by a physically abusive person compared to 6.9% (n=18) in non-bingers. Twenty-one percent (n=13) of the binge drinkers experienced forced sexual intercourse compared to 5% (n=13) in non-bingers. Furthermore, 30% of the binge drinkers were forced to participate in sexual acts compared to 9% in non-bingers. Concerning other substance use; 64.6% (n=42) of the binge drinkers were smokers compared to only 20.7% (n=54) in non-bingers. Almost 50% (n=30) of youths who binge drink were involved in 4 or more risky behaviours compared to 9.7% (n=25) in non-bingers. Findings presented here, are also shown in Table 1.

Multivariable Logistic Regression

After adjustment for gender and ethnicity, all the risky behaviours were statistically significant in their association with binge drinking, with a graded association for the cumulative number of risky behaviours and association with binge drinking still evident (Table 2).

Binge consumers were 7.58 times (95% CI=3.88-14.8) more likely to drive under the influence, compared to those who did not. Participants who were driven by someone who had been drinking were at higher odds of being binge drinkers (OR=6.88, 95% CI=3.40-13.9). Smokers were at increased odds of being binge drinkers (OR=10.82, 95% CI=4.85-24.12) compared to non-smokers. The other risk associations ranged from increased odds by 2.94 times for binge consumers (for participants, who dated people who hurt them physically at least once). An increased

odds by 3.84 times was also observed amongst binge consumers who had experienced partners forcing them to perform sexual acts they did not want to do at least once in the past year. An increase in the association was observed, whereby, the greater the number of risky behaviours, the higher the odds of them being binge drinkers (OR=28.6, 95% CI=9.52-85.93) in participants with 4 or more risky behaviours; followed by (OR=6.88, 95% CI=2.68-18.34) in participants with 2-3 risky behaviours.

DISCUSSION

The study found that almost half (48%) of the Millennials surveyed in the six selected neighbourhoods have consumed alcohol. The binge consumption patterns were higher (20%) compared to other millennials-based studies that projected prevalence of binge drinking between 9 and 14%.^{14,17,32-34} Similarly, associated risk behaviours of participants in this study were similar or much more common than in a study done in 2006 in university students with a mean age of 21. Three-year-old. For example, on the number of times binge consumers drove a vehicle under the influence in this study was 17% compared to 18% in the previous study.³⁵

These binge consumption patterns are of great concern for Malaysians since this study's consumption range was almost the same as high school students from China which recorded binge consumption at 20%.³⁶ Even though Asian consumption patterns are lower than studies in western nations, it is still a concern because it underscores the fact that alcohol consumption patterns may be declining in some nations, but may be on the rise in this region.³⁷

Concerns revolve around the fact that Millennials who consume at unhealthy levels are 29 times more likely to be exposed to risks such as road fatality, physical injuries, other substance use and sexual risks. This study echoed concerns identified by Wong and Lasimbang who also noted that the road fatalities, risk-taking behaviours and substance use are prominent factors among road fatality victims in Malaysia.^{38,39}

Table 2. Multivariable Logistic Regression Models Assessing the Association of Risky Behaviours with Binge Drinking (Outcome), Adjusted for Ethnicity and Gender

Variables	OR	95% CI		p-value
		Lower CI	Upper CI	
Driven by someone who has consumed alcohol	7.58	3.88	14.8	<0.001
Drove a vehicle while under the influence	6.88	3.40	13.9	<0.001
Physical fight	3.02	1.48	6.17	0.002
Date with physical hurt	2.94	1.22	7.09	0.016
Injured in physical fight	3.13	1.21	8.1	0.018
Forced sexual intercourse	3.16	1.25	7.97	0.015
Forced sexual acts	3.84	1.74	8.47	<0.001
Smoking	10.82	4.85	24.12	<0.001
Number of risky behaviours (ref: 1 or less)				
2 to 3	6.88	2.58	18.34	<0.001
4 or more	28.6	9.52	85.93	<0.001

This study is not without its flaws. The primary issue that was encountered was the potential for bias of self-reporting amongst the participants. The social sanctions and societal norms on alcohol consumption within the local context may have biased the response rate and the reporting of exact consumption patterns. Hence, downwards bias — particularly among the Malay-Muslims may have impacted the response, but it is less likely to have the same effect in Indian and Chinese respondents.

The study is also based in six localities; hence, findings are based on a limited number of settings, and this may limit the extent to which the results may be generalised. The response rate (52.5%) was low, and this too may affect the extent to which results can be generalised. This is a common trade-off when investigating socially challenging topics, which alcohol consumption is in Malaysia.

CONCLUSION

In summary, this study's findings and most of the local evidence presented here have echoed the fact that harmful alcohol consumption patterns among local youths are alarming and there is an immediate need to adopt a holistic preventive approach that centres within the communities where youths reside in.^{3,4,17,39,40} Similarly, global evidence also concurs to the fact that the use of community-based interventions to address substance use and risk-taking behaviours amongst the youth is warranted.^{27,28,41-43}

CONFLICTS OF INTEREST

The authors declare that they have no conflicts of interest.

REFERENCES

- Monzavi MS, Afshari R, Nadeem R. Alcohol-related disorders in Asia Pacific region: Prevalence, health consequences and impacts on the nations. *ASLA Pac J Med Toxicol*. 2015; 4(1): 1-8.
- World Health Organization (WHO), editor. Global status report on alcohol and health Web site. https://www.who.int/substance_abuse/publications/alcohol_2011/en/. Accessed March 18, 2020.
- Arshad MRM, Munirah O, Shahdan NA. Alcoholism among Youth: A Case Study in Kuala Lumpur, Malaysia. *Int J Cult Hist*. 2015; 1(1): 21-27. doi: 10.18178/ijch.2015.1.1.004
- Fadzli MM, Amer NA. Alcohol Harm in Malaysia: Always the right time to discuss. *Malays J Psychiatry*. 2014; 2(5): 101-104.
- Tan C. Malaysia ranked world's 10th largest consumer of alcohol Web site. <http://www.thestar.com.my/news/nation/2011/05/23/malaysia-ranked-worlds-10th-largest-consumer-of-alcohol/>. Accessed March 18, 2020.
- Mohamed NM, Marican S, Elias N, Don Y. Pattern of substance and drug misuse among youth in Malaysia. *J Antidab Malays*. 2008; 1: 1-56.
- Mutalip MHBA, Naidu BBM, Kamaruddin RB, et al. How severe is binge drinking in Malaysia and who are at risk? *J Alcohol Drug Depend*. 2013; 1(6): 1-8. doi: 10.4172/2329-6488.1000131
- Miller JW, Naimi TS, Brewer RD, Jones SE. Binge drinking and associated health risk behaviors among high school students. *Pediatrics*. 2007; 119(1): 76-85. doi: 10.1542/peds.2006-1517
- Windle M. Drinking over the lifespan. *Alcohol Res Curr Rev*. 2016; 38(1): 95-101.
- Kohli A, Remy MM, Binkurhorhwa AK, et al. Preventing risky behaviours among young adolescents in eastern Democratic Republic of Congo: A qualitative study. *Glob Public Health*. 2017; 13(9):1-13. doi: 10.1080/17441692.2017.1317009
- Stamates AL, Lau-Barraco C. Impulsivity and risk-taking as predictors of alcohol use patterns and alcohol related-problems. *Addict Res Theory*. 2017; 25:1-7. doi: 10.1080/16066359.2017.1296953
- Coulter R. Detecting, explaining, and reducing substance use, mental health, and violence inequities for sexual and gender minority youth and emerging adults Web site. <http://d-scholarship.pitt.edu/31075/>. Accessed March 18, 2020.
- Miller JW, Naimi TS, Brewer RD, Jones SE. Binge drinking and associated health risk behaviors among high school students. *Pediatrics*. 2007; 119(1): 76-85. doi: 10.1542/peds.2006-1517
- Manickam MA, Mutalip H, Hamid HABA, Bt Kamaruddin RB, Sabtu MYB. Prevalence, comorbidities, and cofactors associated with alcohol consumption among school-going adolescents in Malaysia. *Asia Pac J Public Health*. 2014; 26(5_suppl): 91S-99S. doi: 10.1177/1010539514542194
- Cheah KY. Socioeconomic determinants of alcohol consumption among non-malay's in Malaysia. *Hitotsubashi J Econ*. 2015; 56: 55-72. doi: 10.15057/27194
- Mutalip MHBA, Kamarudin RB, Manickam M, Hamid HABA, Saari RB. Alcohol consumption and risky drinking patterns in Malaysia: Findings from NHMS 2011. *Alcohol and Alcoholism*. 2014; 49(5): 593-599. doi: 10.1093/alcalc/agu042
- Wan RW, Kaur H, Amal N, Lim K. Factors related to alcohol drinking among the adolescents in Federal Territory, Kuala Lumpur. *Malays J Public Health Med*. 2005; 5(1): 23-26.
- Fauziah I, Mohamad MS, Chong ST, Manaf AA. Substance abuse and aggressive behavior among adolescents. *Asian Soc Sci*. 2012; 8(9): 92. doi: 10.5539/ass.v8n9p92
- Lee LK, Chen PCY, Lee KK, Kaur J. Premarital sexual intercourse among adolescents in Malaysia: A cross-sectional Malaysian school survey. *Singapore Med J*. 2006; 47(6): 476-481.

20. Cheah KY. Factors affecting alcohol consumption: The case of penang, Malaysia. *Malays J Health Sci.* 2014; 12(2): 45-51. doi: [10.17576/JSKM-2015-1202-07](https://doi.org/10.17576/JSKM-2015-1202-07)
21. Kortteinen S. Negotiating ethnic identities: Alcohol as a social marker in east and west Malaysia. *Journal of Southeast Asia Social Sciences and Humanities.* 2017;72(1).
22. Fagan AA, Hawkins JD, Richard FC. Engaging communities to prevent underage drinking. *Alcohol Res Health.* 2011; 34(2): 167-174.
23. Flewelling RL, Grube JW, Paschall MJ, et al. Reducing youth access to alcohol: Findings from a community-based randomized trial. *Am J Community Psychol.* 2013; 51(1-2): 264-277. doi: [10.1007/s10464-012-9529-3](https://doi.org/10.1007/s10464-012-9529-3)
24. Holmila M, Warpenius K. Community-based prevention of alcohol-related injuries: Possibilities and experiences. *Int J Alcohol Drug Res.* 2012; 1(1): 27-39. doi: [10.1007/978-1-4612-0233-2_9](https://doi.org/10.1007/978-1-4612-0233-2_9)
25. McLeroy KR, Norton BL, Kegler MC, Burdine JN, Sumaya CV. Community-based interventions. *Am J Public Health.* 2003; 93(4): 529-533.
26. Eccles JS, Gootman JA. *Community Programs to Promote Youth Development.* Washington DC, USA: National Academies Press; 2002: 432.
27. Holder HD, Gruenewald PJ, Ponicki WR, et al. Effect of community-based interventions on high-risk drinking and alcohol-related injuries. *JAMA.* 2000; 284(18): 2341-2347. doi: [10.1001/jama.284.18.2341](https://doi.org/10.1001/jama.284.18.2341)
28. Wandersman A, Paul F. Community interventions and effective prevention. *Am Psychol.* 2003; 58(6-7): 441-448. doi: [10.1037/0003-066X.58.6-7.441](https://doi.org/10.1037/0003-066X.58.6-7.441)
29. Centers for Disease Control and Prevention (CDC). Youth Risk Behavior Surveillance System (YRBSS) Web site. www.cdc.gov/yrbss. Accessed March 18, 2020.
30. Lee L-K, Chen PCY, Lee K-K, Kaur J. Violence-related behaviours among Malaysian adolescents: a cross sectional survey among secondary school students in Negeri Sembilan. *Ann Acad Med Singapore.* 2007; 36(3): 169-174.
31. Johari M, Roslan NM, Nudin S, Saidin M. The youth behaviour risk factor surveillance: statistical report – baseline results. Putrajaya, Malaysia: 2011.
32. Institute for Public Health (IPH), Ministry of Health Malaysia. The third National Health and Morbidity Survey (NHMS III). Kuala Lumpur, Malaysia:2008. 1-37.
33. Al-Naggar RA, Bobryshev YV, Mohd Noor NAB. Lifestyle practice among Malaysian university students. *Asian Pac J Cancer Prev.* 2013; 14(3): 1895-1903. doi: [10.7314/APJCP.2013.14.3.1895](https://doi.org/10.7314/APJCP.2013.14.3.1895)
34. Idayu H, Hussain H, Wan A, Rusdi AR, Tahereh S. Prevalence of alcohol use and mental health status among university and college students in Malaysia. *J Addict Res Ther.* 2014; 5(3): 124. doi: [10.4172/2155-6105.S1.018](https://doi.org/10.4172/2155-6105.S1.018)
35. Liew H, Noor II, Raymond YS, Nadzrah SY, Moy F. Health risk behaviour among undergraduates in a Malaysian Public University: A cross-sectional study. *Journal of the University of Malaya Medical Centre.* 2011; 14(2): 1-8. doi: [10.22452/jummed.vol14no2.2](https://doi.org/10.22452/jummed.vol14no2.2)
36. Lu S, Du S, Hu X, et al. Drinking patterns and the Association between Socio-Demographic Factors and Adolescents' alcohol use in three metropolises in China. *Int J Environ Res Public Health.* 2015; 12(2): 2037-2053. doi: [10.3390/ijerph120202037](https://doi.org/10.3390/ijerph120202037)
37. Ahlstrom S, Osterberg EL. International perspectives on adolescent and young adult drinking. *Alcohol Reserach Health.* 2004; 28(4): 258-268.
38. Wong LP. Socio-demographic and behavioural characteristics of illegal motorcycle street racers in Malaysia. *BMC Public Health.* 2011; 11(1): 446. doi: [10.1186/1471-2458-11-446](https://doi.org/10.1186/1471-2458-11-446)
39. Lasimbang HB, Shoesmith W, Daud M, et al. Private troubles to public issue: Empowering communities to reduce alcohol-related harm in Sabah, Malaysia. *Health Promot Int.* 2017; 32(1): 122-129. doi: [10.1093/heapro/dav090](https://doi.org/10.1093/heapro/dav090)
40. Assuntha M. Global Alcohol Policy Alliance Web site. <https://globalgapa.org/>. Accessed March 18, 2020. 2001.
41. Babor T. *Alcohol: No Ordinary Commodity: Research and Public Policy.* Oxford, United Kingdom: OUP Oxford; 2010: 377.
42. Foxcroft DR, Ireland D, Lister-Sharp DJ, Lowe G, Breen R. Longer-term primary prevention for alcohol misuse in young people: A systematic review. *Addiction.* 2003; 98(4): 397-411. doi: [10.1046/j.1360-0443.2003.00355.x](https://doi.org/10.1046/j.1360-0443.2003.00355.x)
43. Hawkins JD, Catalano RF, Arthur MW. Promoting science-based prevention in communities. *Addict Behav.* 2002; 27(6): 951-976. doi: [10.1016/S0306-4603\(02\)00298-8](https://doi.org/10.1016/S0306-4603(02)00298-8)