Urban youth, their alcohol consumption and associated risk within three ethnic groups in Malaysia

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List of Abbreviations

BAC	Blood Alcohol Concentration
CDC	The Centers for Disease Control and Prevention is the leading national public health institute of the United States
GSHS	Global Adults Tobacco Survey
IMRD	Introduction, Methods, Results and Discussion
MOH	Ministry of Health
NHMS	National Health and Morbidity Survey, Malaysia
NIAAA	National Institute on Alcohol Abuse and Alcoholism
NPHS	National Population and Housing Survey
TTI	Theory of Triadic Influence
SEM	Structural Equation Models
YRBS	Youth Risk Behaviour Survey
WHO	World Health Organization
WTS	Waterpipe tobacco smoking

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Notice 1

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STATEMENT OF DECLARATION

The research for this thesis was conducted by the author in the Monash University Malaysia between December 2012 and March 2018.

I hereby declare that this thesis contains no material which has been accepted for the award of any other degree or diploma at any university or equivalent institution and that, to the best of my knowledge and belief, this thesis contains no material previously published or written by another person, except where due reference is made in the text of the thesis.

This thesis includes three original papers published in peer-reviewed journals and one unpublished publication. The ideas, development and writing up of all the papers in the thesis were the principal responsibility of me, the candidates, working within the Monash University Global Public Health Department under the supervision of Professor Daniel Reidpath and Professor Pascale Allotey.

The inclusion of co-authors reflects the fact that the work came from active collaborations between researchers and acknowledged inputs into team-based research. In the case of Chapters 3, 5, 6, 7 and 8 my contributions to the work involve the following:

Thesis including published works declaration

I hereby declare that this thesis contains no material which has been accepted for the award of any other degree or diploma at any university or equivalent institution and that, to the best of my knowledge and belief, this thesis contains no material previously published or written by another person, except where due reference is made in the text of the thesis.

This thesis includes (*2)* original papers published in peer reviewed journals and (*4)* unpublished publications. The core theme of the thesis is (*Alcohol Use Among Youths*). The ideas, development and writing up of all the papers in the thesis were the principal responsibility of myself, the student, working within the (Malaysia Jeffrey Cheah Sch Of Med & HS) under the supervision of (Professor Daniel Reidpath).

In the case of *(*3, 5, 6, 7 and 8) my contribution to the work involved the following:

Thesis Chapter	Publication Title	Status *(published, in the press, accepted or returned for revision)*	Nature and % of student contribution	Co-author name(s) Nature and % of Co-author's contribution*	Co-author(s), Monash student Y/N*
3	a) Ecological influences on youth alcohol consumption patterns: scoping review on studies within the timeline of 2000-2015	*Accepted by Qualitative Research Conference (QRC) 2018 and papers will be published in the proceeding (ISBN) and will be considered for publication in SCOPUS or INDEXES journal*	*60%. Concept and collecting data and writing the first draft*	*eeta Singh, input into uscript 60%* *sh Subramaniam contributed as studies wer, input 20%* *ssor Daniel Reidpath, review of the draft, into manuscript 10%* *ssor Pascale Allotey, review of draft, input into manuscript 10%*	*Yes*
	b) An ethnographic mapping of alcohol accessibility in different ethnic communities residing in urban and semi-urban areas within Klang Valley, Malaysia.	*Published as a conference abstract*	*60%. Concept and collecting data and writing the first draft*	*1) Sangeeta Singh, input into manuscript 70%* *2) Alexander Tan Zhi Sheng, Liew, contributed in draft write, input into manuscript 15%* *3) Liew Min contributed to results write up as a draft, input into manuscript 5%*	*Yes*
	c) An exploration of perception and risk associated with youth alcohol				*Yes*

Thesis Chapter	Publication Title	Status *(published, in the press, accepted or returned for revision)*	Nature and % of student contribution	Co-author name(s) Nature and % of Co-author's contribution*	Co-author(s), Monash student Y/N*
	consumption within different ethnic communities residing in urban and semi-urban areas within Klang Valley, Malaysia.			*4) Lee Jia Mei, contributed to the introduction write up as a draft, input into manuscript 5%* *5) Anne Jamaludin, review of the draft, input into manuscript 5%*	
5	An ethnographic mapping of alcohol accessibility in different ethnic communities residing in urban and semi-urban areas within Klang Valley, Malaysia.	*Accepted by Qualitative Research Conference (QRC) 2018 and papers will be published in the proceeding (ISBN) and will be considered for publication in SCOPUS or INDEXES journal*	*80%. Concept and collecting data and writing the first draft*	*1) Sangeeta Singh, input into manuscript 80%* *2) Professor Daniel Reidpath, review of the draft, input into manuscript 10%* *3) Professor Pascale Allotey, review of the draft, input into manuscript 10%*	*Yes*

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Thesis Chapter	**Publication Title**	**Status** *(published, in the press, accepted or returned for revision)*	**Nature and % of student contribution**	**Co-author name(s) Nature and % of Co-author's contribution***	**Co-author(s), Monash student Y/N***
7	Internal factors, especially among binge consumers	*Reviewers have provided feedback and revision have been submitted on 5th July 2018 to Elsevier Journal on Alcohol*	*60%. Concept and collecting data and writing of the manuscript*	*1) Sangeeta Singh, input into manuscript 50%* *2) Kwong Hsia Yap, input into results 10%* *3) Peter Natarajan, input into introduction into manuscript 10%* *4) Professor Daniel Reidpath, review of the draft, input into manuscript 20%* *5) Professor Pascale Allotey, review of the draft, input into manuscript 10%*	*Yes*
8	a) Intrapersonal and interpersonal factors of youth alcohol consumption and tobacco use	*Under review*	*80%. Concept and collecting data and writing of the manuscript*	*1) Sangeeta Singh, input into manuscript 80%* *2) Professor Daniel Reidpath, review of the draft, input into manuscript 10%* *3) Professor Pascale Allotey, review of the draft, input into manuscript 10%*	*Yes*

	b) Shisha (water pipe) smoking initiation among youth in Malaysia and global perspective: a scoping review (2006-2015)	*Published*	*60%. Concept and collecting data and writing of the published paper*	*1) Sangeeta Singh, input into manuscript 60%* *2) Loo Enzhong, contributed to the initial draft write up, input into manuscript 20%* *3) Professor Daniel Reidpath, review of the draft, input into manuscript 10%* *4) Professor Pascale Allotey, review of the draft, input into manuscript 10%*	*Yes*

**If no co-authors, leave fields blank*

I have renumbered sections of submitted or published papers to generate a consistent presentation within the thesis.

Student signature: [redacted] **Date:** 15th March 2018

The undersigned hereby certify that the above declaration correctly reflects the nature and extent of the student's and co-authors' contributions to this work. In instances where I am not the responsible author, I have consulted with the responsible author to agree on the respective contributions of the authors.

Main Supervisor signature: [redacted] **Date:** 13 April 2018

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Thesis summary

Objectives: To investigate the patterns of alcohol consumption and ecological factors influencing those patterns within the Malaysian context. The study focuses on youth from the Chinese, Indian and Malay ethnic groups who reside in urban and semi-urban localities in Klang Valley, Malaysia.

Methods: This mixed method study is a combination of ethnography mapping, interviews and self-administered questionnaires that were in dual language (Bahasa Malaysia and English). An ethnographic field observation was done with the use of a tool that measured the availability of alcohol and ads of alcoholic beverages in food and beverage outlets. Self-administered questionnaire collated information on socio-demographic characteristics, risk behaviors associated with consumption patterns, smoking and socialization factors that revolve around alcohol use. Convenience and purposive sampling were used to recruit the study sample across five sites: Ampang, Cheras, Petaling Jaya, Setapak and Sentul.

Results: Ethnography mapping revealed that Chinese populated areas have the highest density of alcohol outlets (0.9-10.9/100m radius). 33% of stores operated over 24 hours while others closed at 10 p.m. Beer (94%) and liquor (58%) were commonly sold, while beer is the preferred drink for younger adults within the age range of 18-25-year-old. Self-administered questionnaire completed by 326 respondents; comprising of 103 Malays, 111 Chinese and 112 Indians. 171 (52%) male and 155 (48%) female respectively. Mean age was 21 years. Of those who had at least one family member who consumed alcohol; 72% had tried alcohol, 48% were current consumers, and 30% were binge drinkers. Approximately 80% of these binge drinkers were male. More than half (54%) of the binge drinkers were Indians followed by Chinese at 39% and Malays at 8%. Up to 44% of the youths were sexually active, the highest proportion of binge drinkers (73%). Those who binge drink were nearly three times more likely to be

forced into sexual intercourse (OR=2.79: 95%CI=1.02-7.65) and 3.5 times more likely forced to do sexual acts than non-drinkers (OR=3.54: 95%CI=1.55-8.06). Binge consumers were also 17.5 times more likely to smoke compared to current consumers (OR=4.40 9% CI=1.48-1313).

Conclusion: Binge consumption among youth is associated with a myriad of behavioral risk factors and alcohol-related negative consequences. Multiple strategic approaches that address respective ethnic groups, cultural norms and gender-based differences could improve the efficacy of preventive interventions within the Malaysian context.

CHAPTER ONE: INTRODUCTION

1.1 Background

Substance abuse refers to the harmful or hazardous use of a psychoactive substance. Psychoactive substances such as amphetamines, alcohol, cannabis, cocaine, opioids, or non-prescribed medication have been known to affect 250 million people, or 3.5% to 5.7% of the world's population within the age range of 15-64 years old ("WHO | Substance abuse," n.d.). People tend to use the substance for its known effects that can alter the users' consciousness and moods. Initially, the substance used may appear to have positive effects by lifting an individual's mood, inducing a relaxed feeling or by providing a boost of energy. However, as described in Figure 1, there are negative outcomes from substance use which could have negative impacts on an individual's mental and physical health (WHO, 2016).

The harmful use of alcohol results in 3.3 million deaths each year.

On average every person in the world aged 15 years or older drinks 6.2 litres of pure alcohol per year.

Less than half the population (38.3%) drinks alcohol. This means that those who do drink consume on average 17 litres of pure alcohol annually.

At least 15.3 million persons have drug use disorders.

Injecting drug use reported in 148 countries, of which 120 countries have the HIV infection among their population.

Source: World Health Organization; Management of Substance Abuse- Facts and Figures: information assessed on 20th March 2016. http://www.who.int/substance_abuse/facts/en/

Figure 1: Facts and Figures on Substance Abuse

It is crucial to recognize the negative consequences of substance use and the harmful effects it has on an individual's physical and mental health. Continued use of substances may lead to dangerous health issues such as cancer, diabetes, liver failure, cardiovascular problems, sexually transmitted diseases, and mental health disorders. There is also growing evidence that point towards excessive substance use having a negative impact on society at large. For instance, an individual's substance abuse patterns affect the functional aspects of a family context. This may lead to economic and societal burden, which goes beyond an individual's relationships and their life in general (WHO, 2010a);(Schulte & Hser, 2014).

Thus, there is a need for individuals, families, and their communities to identify and comprehend the use and abuse of substances to avoid detrimental outcomes. This is particularly imperative when addressing alcohol use. Hence, medical experts have used evidence to identify specific classifications to ascertain the impact of varying levels of substance use. The level of consumption is categorized as low, moderate, or high to indicate the level of severity; which is determined by the number of diagnostic criteria met by an individual (Robinson & Adinoff, 2016). An example of such categorization on alcohol misuse disorder and adverse outcomes from such use is provided in Table 1.

Such classification is necessary since the "First global report on substance use disorders" report from ATLAS site launched by the World Health Organization (WHO) – indicated that harmful use of substances is most evident among those who consume alcohol. The harmful consumption of alcohol has resulted in 3.3 million deaths annually at a global level (WHO, 2016). In 1999, alcohol consumption was responsible for over 55,000 deaths among Europeans aged 15 to 29 (Rehm et al., 2003). By 2012, the number of global deaths attributed to alcohol abuse rose to 5.9% (3.3 million), with 7.6% of deaths among males and 4.0% of deaths among females (WHO, 2014). The impact of binge consumption is troubling, and such concerns are based on the fact that 16% of binge drinking patters are observed among youth within the age range of 15 years or older at the global level (WHO, 2014).

Table 1: Alcohol ranking sheet and adverse outcomes described as critical facts by the World Health Organization

Substances	Low	Moderate	High	Key Facts (World Health Organization)
Alcohol	0-10drinks (week)	11-26drinks (week)	27+drinks (week)	▪ Worldwide, 3.3 million deaths every year result from alcohol abuse This represents 5.9 % of all deaths ▪ The harmful use of alcohol is a causal factor in more than 200 diseases and injury conditions ▪ Alcohol consumption causes death and disability relatively early in life. In the age group 20 – 39 years, approximately 25 % of the total deaths are attributed to alcohol
*Low consumption scale for men accounts for 2 drinks and women 1 drink a day *Moderate consumption scale for men accounts for 3 and women 2 drinks a day *High or harmful consumption measures which is equivalent to ≥5 drinks for men or ≥4 drinks for women, within ~2 hours on any given day in a week.				

Sources: Examples of alcohol use disorders, its usage following the "Alcohol, Smoking and Substance Involvement Screening Test- ASSIST"

*National Institute on Alcohol Abuse and Alcoholism (NIAAA): A standard US "drink" in the definition mentioned above refers to half an ounce of alcohol (i.e., 14 g ethanol)

1.2 Youth and alcohol consumption

Evidence from "The WHO Global Survey on Alcohol and Health (2008)", which assessed a five-year trend of underage drinking in 73 countries, revealed that consumption patterns in most countries increased by 71%. While some nations reported a slight decline of 4%, a few (8%) reported a stable trend and 16% showed inconclusive trends. This report also concluded that a five-year trend of drinking amongst 18 to 25-

year-olds in 82 countries, increased by 80%. Harmful drinking patterns such as binge drinking seem to be on the rise among adolescents and young adults (WHO, 2007; McAllister, 2003). A systematic review in 2011 revealed that those who drink heavily at a younger age have the propensity to experience alcohol-related injury and alcohol dependence later in life. These negative consequences from harmful alcohol consumption make up a significant portion of the mortality statistics (Foltran, Gregori, Franchin, Verduci, & Giovannini, 2011);(Rehm et al., 2003).

Mortality and morbidity of alcohol use among college-going students were analyzed from 1999 to 2001 in the US, that revealed that 500,000 students were unintentionally injured due to alcohol use and 600,000 were hit or assaulted by a student who was under the influence of alcohol (Hingson, Heeren, Winter, & Wechsler, 2005). Such riskier consumption patterns and the detrimental effect is worrying within young adults of the age range of 16-24 years old, who are 20 times more likely to die of harmful consumption (Health, 2011). Thus, it is important to monitor the distribution of the population who consumes alcohol at a riskier level. Such monitoring mechanism could inform riskier alcohol use patterns within specific individuals who may be vulnerable to additional risk that derives from different social and ethnic backgrounds (Babor, 2010);(Seaman & Edgar, 2012);(Schulte & Hser, 2014).

The monitoring of riskier alcohol may help to inform and quantify the impact of alcohol use in the general population and there have been various achievements in monitoring alcohol use at global and national level. However, such a mechanism may pose its own limitations (WHO, 2000);(Health, 2011);(WHO, 2012) especially when young adults consumption patterns are taken into account. For instance, a systematic review of fifty-six studies that looked at rigorous evaluation process which measures alcohol-related problems, risky sexual behaviours, violence and crime, revealed the fact that there needs to be more emphasis to improve monitoring outcome measures (Foxcroft, Ireland, Lister-Sharp, Lowe, & Breen, 2003). Especially, when an increase in violence, anti-social behaviours (McKinlay, Forsyth, & Khan, 2009), unplanned sexual activities, and sexually transmitted diseases (Rashad & Kaestner, 2004);(Seaman & Ikegwuonu, 2010) are all closely associated to excessive consumption among the young adults.

1.3 Malaysian Context

Historically, alcohol was imported into Malaysia by the Portuguese and Dutch merchants in the late 17th and 18th centuries. By the late 1960s and early 1970s, breweries started to emerge in Malaysia (Jernigan & Indran, 1997). Taxes earned by Carlsberg brewer in 2015 indicates that the government of Malaysia and

Singapore received 41% of its revenue, amounting to RM683 million (Khoo, 2016). In addition to that, the local government earned RM8 billion (approximately US$2 billion) in taxes from alcohol sales since 2013-2016 ("Brewers to seek govt review of alcohol taxes," 2017). There are also concerns about how contraband alcohol sales have increased over the years (Joibi, 2014). A leading Non-Governmental Organization (NGO) - the Consumers Association of Penang, estimated in 1996, that the local spirits industry produced approximately RM180 million (US$43.4 million) worth of "*samsu*[1]" [the generic title for cheap local spirits]" annually. *Samsu* contains an average of 38% alcohol and is widely available illegally at off-premise retail outlets and private residences(McNeil, 2001).

1.3.1 Consumption patterns

Although Malaysia today has a relatively low per capita alcohol consumption level, local evidence documents a small segment of the population who consume heavily and experience numerous alcohol-related problems (Jernigan & Indran, 1997);(MIROS, 2012);(Cheah, 2014).

Table 2: Total alcohol per capita (15+) consumption, drinkers only (in liters of pure alcohol), 2010

Alcohol per capita (15+) consumption (in litres of pure alcohol)

	Average 2003–2005	Average 2008–2010	Change
Recorded	0.5	0.3[t]	→
Unrecorded	0.3	1.0	↗
Total	**0.8**	**1.3**	↗
Total males / females		2.5 | 0.2	
WHO Western Pacific Region	5.4	6.8	

[t] Tourist consumption deducted when at least as many tourists as inhabitants.

The Malaysian National Health and Morbidity Survey (NHMS) of 1996, aimed to estimate the prevalence of alcohol consumption among non-Muslim adults in Malaysia. The national survey results indicated that within the 23% of the population who drank, 33% displayed high consumption patterns (MOH 1997). By the turn of the century, there was an increasing prevalence of current consumers 11.1% (2006) vs 11.6% (2011). Similar to this, there were also prominent (50.2% CI: 46.9%-53.5%) binge consumption patterns observed among current consumers. Males (M17.2%; F5.7%) significantly consumed more alcohol and portrayed much riskier consumption patterns (MOH, 2011). By 2011, the number of current consumers was more prominent in urban cities

[1] Samsu, is a locally distilled potent spirit with an alcohol content of between 37% and 70%. There are over 150 brands of samsu available in the market. The majority of alcohol consumers among the rural poor are samsu drinkers. Assunta M. The alcohol problem in Malaysia. The Globe Special Issue 4.Global Alcohol Policy Alliance, 2001–2002

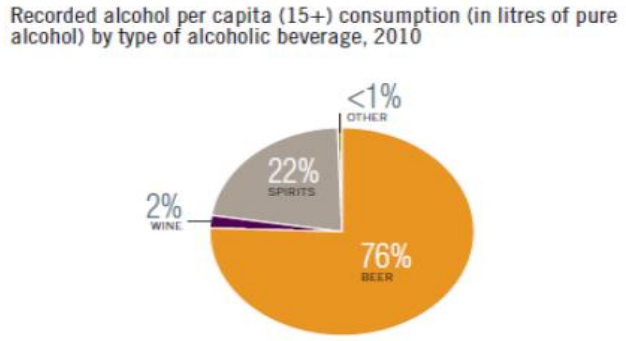
(12.6%) compared to rural areas (8.9%). Alcohol use was more prevalent among Chinese urbanites with high household income and a higher level of education. Conversely, risky consumption was more frequent among rural drinkers - in Sabah and Sarawak- especially among those with a low level of education and little household income. The estimated odds of harmful consumption increased by a factor of 3.5 among males, while it increased by a factor of 2.7 among the east Malaysian's living in Sabah and Sarawak (Mutalip, Naidu, Kamaruddin, Hamid, et al., 2013).

By 2014, according to WHO report; Malaysia recorded a total alcohol per capita consumption (age 15+) of 0.8 litres of pure alcohol from 2003-2005. Such consumption patterns increased to 1.3 litres of pure alcohol between 2008 and 2010 (Table 2). A similar increase was also evident amongst women (age 15+) who consumed 2.8 litres of pure alcohol per capita (Table 3) in 2010 (WHO, 2014). Beer is the most popular type of alcoholic beverage in Malaysia, and it totals approximately 76% of all recorded alcohol consumption, followed by spirits at 22% and wine at 2% (Figure 2).

Table 3: Prevalence of alcohol consumption with different gender group

Total alcohol per capita (15+) consumption, drinkers only (in litres of pure alcohol), 2010	
Males (15+)	13.5
Females (15+)	2.8
Both sexes (15+)	10.5

Figure 2: Type of alcohol consumed



1.3.2 Consumption patterns within respective ethnic groups

As discussed above, ethnic group alcohol consumption patterns were the predominant factor in ascertaining consumption prevalence within Malaysians context. These differences are noticeable amongst Malaysia's multi-racial society, which consists of Malay-Muslims (67%), Chinese (25%), Indians (7%) and others (0.7%). A survey conducted between November 1996 and April 1997 in Kuala Selangor among 523 respondents found that 12% (all of whom were male) admitted to drinking alcohol. The consumption patterns were dominant amongst Chinese (32%) and Indians (23%). Only one Malay respondent admitted to drinking alcohol (Korteinnen, 1999). A small population-based survey in 1980 revealed that Indian men were the most likely to drink daily and to consume three or more drinks per occasion (Armstrong, 1985). The national surveys continued to show heavy episode consumption patterns among the Chinese and Indian ethnic groups; whereby the cross-

sectional or case studies from local context reflect similar consumption patterns among the Malay ethnic group. For example, a study of all hospital admissions in the late 1980's found that 52% of Chinese, 38% of Indians, and 24% of Malays were current drinkers. Another study published in 1994 of consecutive attendees at a general practice in Kuala Lumpur identified 70% of the Chinese, 42% of Indians and 11% of Malays were current consumers (Wines, 1996). By 1995, a study revealed that there are approximately 5% of rural Malays who consume alcohol, while nearly a third of indigenous people drink "*samsu*" as an integral part of their culture and festivities (Arokiasamy, 1995).

By the 21st century, the prevalence of current alcohol consumers within the respective states in Malaysia varied between 0.3 to 19.3% respectively. The prevalence of current consumers within each ethnic group was: Chinese 27.5%, Indian 18.8% and Malays 0.9%. However, binge consumption patterns were prominent among Malays and other ethnic groups at 63% (MOH, 2011). Even though ethnic group consumption patterns may differ but there was a close association of consumption patterns with the numbers of consumers within the similar age group. For instance, national data from each ethnic group reveals the fact that prevalence of current consumers within the age range of 30-49 years old is (42.9%); followed by 36.3% among 15 to 29 years old. Similarly, other local evidence also revealed that there were harmful consumption patterns noted among young adults from all three main ethnic groups in Malaysia (Mutalip et al., 2013);(Habil et al., 2011);(Assuntha, 2001);(Manickam, Abdul Mutalip, Hamid, Bt Kamaruddin, & Sabtu, 2014);(Rozita, Kaur, & Lim, 2005).

1.3.3 Government responses

The growing issues from harmful alcohol consumption patterns and its impact on society as a whole compelled the local authorities to revisit the policies on alcohol use within the local context. Firstly, the local government increased the minimum age requirement for consuming alcohol from 18 to 21 (IPH, 2015). This amendment prohibits the selling of alcohol to anyone below 21 years of age. In addition, a regulatory act 361(5) of the Food (Amendment) Regulations 2016 stated that alcohol products must be displayed in a separate cabinet or shelf from the ones used for food ("It's Official," n.d.). Drinking and driving laws in Malaysia defines the legal limit of alcohol level in the bloodstream to be 0.08[2]. However,

[2] 80 milligrams of alcohol in 100 milliliters of blood (0.08). An *alcohol* unit is *80 mg* or 8g of pure *alcohol*, which is equivalent to 150ml of beer, 76ml of wine or 25ml of spirit. Similar limits are also noted in other countries such as Canada, Ireland and UK

the Shariah Law that applies to 67% Muslim population in Malaysia, affirms that Muslims are forbidden from drinking alcohol - penalties may include public canning ("Alcohol Policies in Malaysia," n.d.).

Besides such strict prohibition practices, the health and social impact of alcohol consumption within the country is on the rise and approximately 13 local studies showed that such an increase in consumption leads to various negative consequences (Arshad et al, 2015);(Cheah, 2015);(MI & Amer, 2014);(Idayu et al, 2014);(Farid, Rus, Dahlui, Al-Sadat, & Aziz, 2014);(Mutalip et al., 2013);(Devi, 2013);(Hock, Ghazali, Cheong, Rahman, & Mustafa, 2012):(Al-Naggar, Bobryshev, & Mohd Noor, 2013);(Mohamed, Marican, Elias, & Don, 2008).

1.3.4 Youth and alcoholism

The most adverse consequence of alcohol use is evident amongst young Malaysian adults. Local evidence from 2001 and 2008, reported that more teenagers were consuming alcoholic beverages at an earlier age. At the turn of the century, 45% of Malaysian youth from the different ethnic group, under the age of 18 consumed alcohol regularly. Of all the legal and illegal drugs, alcohol is by far the most widely used by teenagers (Assunta, 2001);(Kortteinen, 2008);(MOH, 2011);(Mutalip, Kamarudin, Manickam, Abd Hamid, & Saari, 2014a).

However, local studies that aimed at ascertaining alcohol consumption patterns amongst the youth were predominantly done in academic or formal institutions as mentioned in Table 4. The evidence collected in Table 4, highlights the fact that school-based or higher education institution surveys may not accurately reflect alcohol consumption patterns and harmful behavior amongst the youth (Lee, Chen, Lee, & Kaur, 2006);(Afiah et al, 2006);(Rozita, Kaur, & Lim, 2005). There is sufficient evidence on the importance of capturing or reflecting harmful consumption patterns among the youth. For instance, a systematic review in 2011, on consequences of alcohol use among late adolescence have shown that it's important to reduce harmful alcohol use in adolescence, earlier on so that long-term adverse consequences are prevented (McCambridge, McAlaney, & Rowe, 2011). Thus, to understand the harmful aspects of alcohol use among youth, there is a need to access the whole aspect of youth and the environment, in which they consume alcohol. The environment in this context refers to the ecological factor of youth, which would require a multifaceted community-based study. This type of study may help capture complexities and associated behavioural patterns that are closely related to alcohol consumption (Flewelling et al., 2013). The findings

from such investigations will be able to guide interventions that address issues pertaining to individual risk-taking behaviour, social and environmental factors which includes positive and negative risk factors (Masten, Faden, Zucker, & Spear, 2008);(Miller, Naimi, Brewer, & Jones, 2007). These form of guidance is needed, since local researchers are also emphasizing the need for interventions that address long-term goals, such as, decreasing consumption and preventing associated harms from alcohol consumption amongst Malaysian youth (Assunta, 2001);(Hasin, Grant, & Weinflash, 1988);(IPH, 2008);(Mutalip et al., 2013). As reflected in Table 4, the local youth consumption patterns are quickly evolving through the transitions that are noted between the current and binge consumers. Once again, emphasizing the need to monitor ecological issues that reflects the intrapersonal, interpersonal and social environmental factors and its impact on youth alcohol consumption patterns, as it evolves.

Table 4: Local evidence on adolescent and youth alcohol consumption patterns

(Multiple school-based studies sample size: 8,532:age 11-20)		(National Data Sample size 504: age 18-29)			(Global School Health Survey Sample size: 25,507 age 13-17)		(University students Sample size 150- age 15-24)		
Items	%	**Items**	**Prevalence**		**Items**		**Items**	**Consumption Level**	
Wan et al, 2005		*2011 NHMS*			*GSHS, 2012*		*Arshad et al 2015*		
			Current	**Binge**					
Only age 16-20 years of age		Urban	13%	22%	*Only age 13-17 years of age*		Malay	101	
Malay	63%	Rural	9%	30%			Chinese	27	
Chinese	50%	Male	17%	28%			Indian	22	
Indian	10%	Female	6%	28%					
Male	60%	Binge		23%	Binge	30%	Binge	18-24	30%
Female	40%	Current		14%	Current	9%	Current	18-24	44%
Consume	51%	Tried		18%	Tried	6%	Tried	18-24	61%
Prevalence	*9%*	*Prevalence*		*14%*	***Percentage of consumption especially on current and tried is higher- but there is an age difference***				

Source: (Wan, Kaur, Amal, & Lim, 2005); (MOH, 2011); (Mutalip, Kamarudin, Manickam, Abd Hamid, et al., 2014a) (Manickam et al., 2014); (Mohd, Munirah, & Nurul Afiqah Shahdan, 2015).

The understanding of ecological contributing factors that revolves around youth intrapersonal, interpersonal and social environmental influences will shed light on the drinking culture of Malaysian's youth from three main ethnic groups. Especially since local and global research have emphasized the need to address these forms of unhealthy behavioral patterns among youths who consume alcohol at harmful levels (Wan et al.,

2005);(Mohd et al., 2015);(Manickam et al., 2014);(Sher & Zalsman, 2005);(McKinlay, Forsyth, & Khan, 2009);(Lum, Corliss, Mays, Cochran, & Lui, 2009).

Hence, this study aims to investigate the correlation between levels of consumed alcohol and its association with various health risk behaviours. The current research will focus on the urban youth living in Klang Valley[3], Malaysia since local evidence has indicated that prevalent alcohol use is noted among urbanites. This multifaceted community study will take place within the community where such youth are residing. This would address some of the limitations highlighted in previous local studies.

1.4 Thesis structure

This thesis is submitted as a PhD thesis by publication. The thesis cohesion is built upon Monash Regulations that require three papers by publications. The published papers from this thesis are submitted in the format of Chapters or attached as an appendix that strengthens the evidence defended in this thesis. Therefore, there may be some coinciding information that would be reflected in the thesis chapters. Efforts will be made to minimize duplication.

At the time of submission, two conference abstracts were published, and two other papers are published as journal papers. Four additional papers are submitted and currently being reviewed. Each paper is drafted based on IMRD {Introduction, Methods, Results and Discussion} format and declaration of author's contribution is provided in the chapter that is based on published papers. Throughout the thesis, a reference to the researcher is specifically referred to the author of the thesis- Sangeeta Singh.

Chapter two in this thesis describes the conceptual framework that guides the study structure and links the relationship between the different constructs that are investigated here.

Chapter three describes the literature review on ethnic group, gender, family and peer influences regarding youth alcohol consumption patterns.

Chapter four addresses the study methodology and elaborates on activities in which this study was done.

[3] Greater Kuala Lumpur and Klang Valley (Greater KL/KV) region had a population of approximately six million as of 2010: As part of the Kuala Lumpur National Conurbation, it is the largest urban center in the country. Based on 2010, housing census: https://www.dosm.gov.my/v1/.

Chapter five reflects upon the social-cultural environmental influence which primarily describes the ethnographic findings that explore the social and cultural norms of the community in which the youth resides. Thus, issues such as accessibility and availability of alcohol are investigated.

Chapter six encapsulates the interpersonal influences that impact youth alcohol consumption patterns within the local context.

Chapter seven describes the intrapersonal influences that are predominantly evident amongst the youth who consumes alcohol at harmful levels.

Chapter eight describes patterns of tobacco use, which is a predominant risk factor that is closely related to alcohol and is significantly high amongst the local youth.

Chapter nine encapsulates the discussion from the findings described in the chapter's five to eight.

Chapter ten of this thesis will summarize the findings and focus on the prospect that resonates with the significance of this study.

CHAPTER TWO: CONCEPTUAL FRAMEWORK

2.1 Background

As described in chapter one, growing evidence has demonstrated that there are complex interactions between ecological factors such as intrapersonal, interpersonal and the sociocultural environment within the alcohol consumption patterns amongst the youth (McMorris et al., 2011);(Wood et al., 2004);(Kuntsche et al., 2009b);(Barbour et al., 2013);(Cook et al., 2013); (Bronfenbrenner, 1979);(Flay, Snyder, & Petraitis, 2009). These factors may include patterns of consumption which increases due to availability (Wechsler & Nelson, 2015);(Pollack, Cubbin, Ahn, & Winkleby, 2005);(Connor, Kypri, Bell, & Cousins, 2011) or the rise of risk-taking behaviours which are firmly related to all forms of substance use (Hawkings, Catalano, & Miller, 1992);(Miller et al., 2007);(Stamates & Lau-Barraco, 2017).

This study applied "The Theory of Triadic Influence" (TTI); to explore the mechanism and pathways through which the ecological landscape of the youth influences their alcohol consumption patterns. TTI has been used for many studies on substance use (Snyder & Flay, 2012). The evidence from this exploratory study could potentially help guide a systematic approach to developing a comprehensive public health prevention strategy which is much needed in Malaysia (K. Y. Cheah, 2015);(Mohd Ramlan Mohd, Munirah, & Nurul Afiqah Shahdan, 2015);(Manickam, Abdul Mutalip, Hamid, Bt Kamaruddin, & Sabtu, 2014);(MI & Amer, 2014).

2.2 Study framework

TTI consists of three streams of causations; starting with the ultimate causation that broadly addresses the fact that an individual may not have control over streams of influence that revolve around ones intrapersonal, interpersonal and sociocultural environment. In this study context, the intrapersonal influence which is directly linked to an individual ability to manage self-control and build resilience around alcohol use within the local context will be explored. Issues on how much alcohol is consumed and what is consumed will be assessed to ascertain associated risky behaviours. The interpersonal influence at the causation level impacts an individual association through one's family and friend's practices on how much

and how alcohol is consumed. Hence, consumption frequency and risky behaviours of youth family members and friends will be explored. Finally, the ultimate causation from sociocultural environment influences that are directly associated with ethnic group anomie around alcohol use will be investigated. This causation factor may be difficult to change; however, when change is possible, the impact is much more pervasive (Bingham & Souza, 2012);(Flay et al., 2009);(Flay, 1999).

Secondly, the distal influences that impact youth's intrapersonal, interpersonal and sociocultural environment are equally pertinent as well. For instance, intrapersonal factors such as personal competence, self-esteem and personal control are important attributes that must be understood and explored so that targeted interventions could be developed. In addition to that, interpersonal influences that revolve around social bonding, development and learning are eminent issues to take into consideration. These forms of consideration that assess knowledge, cultural identity and values come into play when sociocultural environmental influences are deliberated. Hence, this study will explore the influence of social nexus which addresses issues such as parental bonding, monitoring and communications around alcohol use. Such investigation is deemed necessary since evidence has indicated that regular monitoring and close guidance do help promote healthier behaviours among the youth (McMorris et al., 2011);(Wood et al., 2004). It is also necessary to note that the other aspects of social nexus, also highlights the importance of peer influences on youth behaviour when alcohol consumption patterns are observed (Duncan, Duncan, & Strycker, 2006);(Barbour et al., 2013);(Henry, Slater, & Oetting, 2005). For instance, peer deviance and encouragement of alcohol use is related to an increase in alcohol use among adolescents as young as age 9 year old (Duncan, Gau, Duncan, & Strycker, 2011);(Salamé, Barbour, & Salameh, 2013); (K. G. Anderson, Tomlinson, Robinson, & Brown, 2011a);(Henry et al., 2005a).

Finally, the proximal predictors which assess the social skills, conformity and subjective utility; are all important behaviours for exploration so that an integrated approach/intervention could be deployed. These integrative theories can derive from the theory of decision making and problem-solving; the theory of reasoned action and theory of planned behaviour. All of these theories are taken into consideration in tackling behavioural change, which could lead to widespread effects. Thus, as illustrated in Figure 4 below; understanding the causation effects and streams of intrapersonal, interpersonal and environmental influences could help guide the integration aspects of alcohol prevention strategies that would benefit young Malaysians (Flay et al., 2009);(Crosby, Salazar, & DiClemente, 2013).

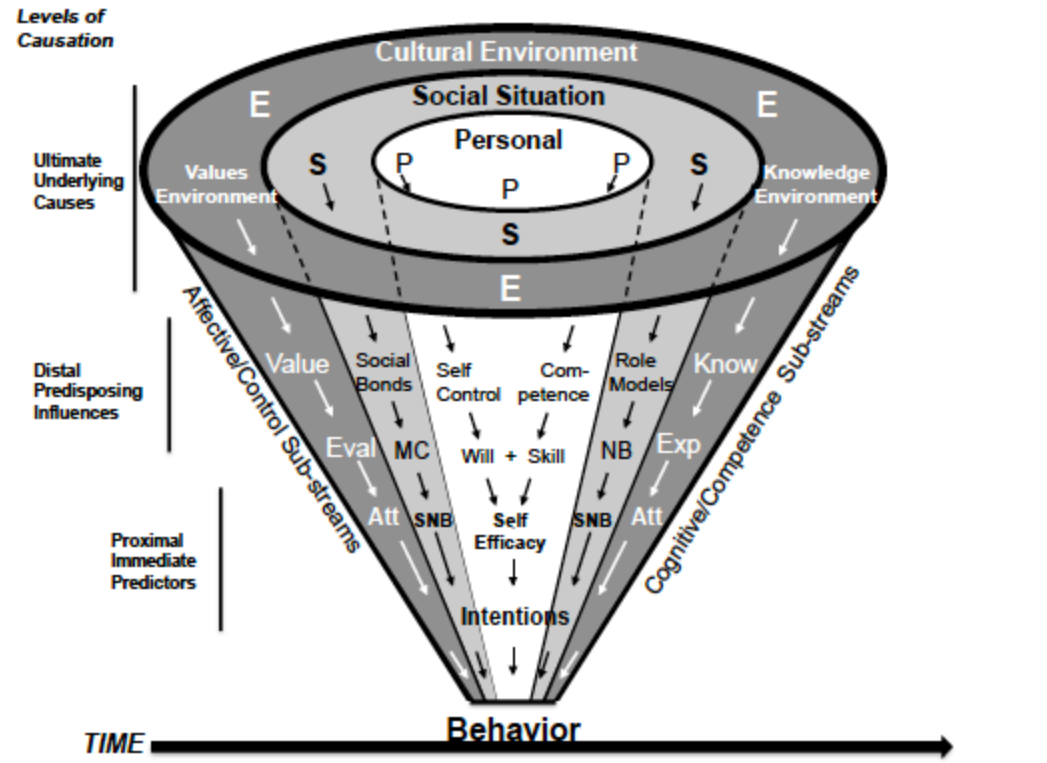


Figure 3: An overview of The Theory of Triadic Influence Ecological System

In addition, an ecological view of TTI also corresponds to ideas derived from other scholars of public health ecological models such as the Bronfenbrenner ecological model. This model consists of the four contextual systems of micro, meso, exo and macro, that is also reflecting Bandura's social learning. This both model and theory emphasise the fact that the young learn from observing their environment (McLeroy, Bibeau, Steckler, & Glanz, 1988);(Bronfenbrenner, 1979);(Crosby, Salazar, & DiClemente, 2013);("Social Learning Theory Bandura Social Learning Theory," 2015). The application of TTI, three streams of influences are used to understand the aetiology of behaviour domains in substance use patterns amongst the youth in Malaysia. As mentioned above, this study exploration will be conducted on youth who reside in five semi-urban and urban areas within Klang Valley, Malaysia.

It is hoped that the understanding of the three streams of influences would shed light on the accessibility, availability, neighbourhood effect and societal norms/sanctions of alcohol use among youth from respective

ethnic groups who are residing in the selected areas. The alcohol accessibility issues were commonly discussed as focal concerns by several local studies (Kortteinen, 2008);(Assuntha, 2001);(Jernigan & Indran, 1997). Thus, this form of investigation would help guide appropriate prevention strategies that would be useful in specific residential communities (Bloomfield & Stock, 2013);(Gruenewald, 2007);(Musick, Seltzer, & Schwartz, 2008).

In addition to ascertaining the information on the accessibility of alcohol in areas where youth resides, there is also an emphasis on understanding the influences of neighbourhood norms which may assert certain patterns of behaviours onto the family and social circles of the youth.

The following process aims to capture the interpersonal characteristics of youth who consumes alcohol. This includes issues pertaining to normative influences of family, friends and peer's consumption practices, which may impact youth's alcohol consumption behaviours. Global and local evidence indicate that understanding of normative influences is crucial in developing targeted intervention packages (Yeh, 2006);(Duncan et al., 2011);(Anderson & Anderson, 2009);(Wan, Kaur, Amal, & Lim, 2005);(Assuntha, 2001).

Finally, the intrapersonal characteristics of local youth residing in these five areas will be explored. For instance, issues such as knowledge, opinions and actions of the youth about their alcohol use will be assessed. Moreover, demographic attributes labelled as facilitators such as gender, ethnic group and personality which could inhibit low, moderate or binge alcohol consumption levels (Pettigrew & Donovan, 2003) will be examined.

This study builds its conceptual framework by integrating TTI tiers of influences that specifically address key aspects of youth alcohol use by addressing the causation factors as summarised in Table 5.

Table 5: TTI Streams of influences and level of causation explored in this study

Intrapersonal factors:	**Interpersonal factors:**	**Sociocultural environmental factors**
Personality traits of youth age 18-25 years old: Demographics characteristics - such as age, gender and ethnic group association.		
Internal influences: knowledge, opinions and actions of youth, regarding alcohol use	*Normative influences* of family and peer consumption practices	*Influences of accessibility, availability,* of alcohol in the neighbourhood and societal norms/sanctions practices around alcohol use

2.3 Importance of such concept in the local context

As indicated in Table 5, the independent variables that predict behaviour into three level of influences are knowns as streams. The contextual measures used to describe patterns of alcohol availability and control in youths perspective within their community settings will be explored. Youth responses would be measured to issues pertaining to perceived ease of alcohol availability, knowledge of alcohol policy enforcement, and community reactions in terms of youth behaviour around alcohol use.

These streams can then help to ascertain the impact of the ultimate, distal and proximal factors. For instance, in the sociocultural environment, the study aims to understand the influence of ultimate factor which is usually beyond individual control. For example, the cultural environment one belongs to is closely associated with social norms. The understanding of such norms in the local context and its impact on a mixed ethnic nation such as Malaysia can be challenging. Half of the population in Malaysia are Malays, 30% are Chinese, and 10% are Indians. Local studies have indicated challenges in understanding associated behaviours, norms and sociocultural impact of all three ethnic groups in Malaysia; especially in order to ensure a healthy lifestyle, early detection and timely responses to communicable and non-communicable diseases (Teh, Tey, & Ng, 2014);(Tan, Dunn, & Yen, 2011);(Wong, 2012);(Cheah, Chang, Hazmi, & Wan Muda, 2016).

As for the distal factor, this refers to the nonbiological influences observed from interactions an individual is exposed to; for instance, the developing, modelling and family norms of the youths family members or peers are relevant here (Flay et al., 2009). These forms of influences are noted in few local studies, which

reports riskier incidences of substance use is noted among the youth with peers or family members with similar patterns of use (Mohamed, Marican, Elias, & Don, 2008);(Foo, Tam, & Lee, 2012).

The third stream of influences focuses on cultural norms that address the issues pertaining to advertisement, availability and accessibility of alcohol and other forms of substances within the neighbourhood youth reside in. These forms of norms are important factors for consideration especially for policy implementers and public health programme planning because structural issues can have a direct impact on health risk behaviours (Sudhinaraset, Wigglesworth, & Takeuchi, 2016). Likewise, local evidence has also started to view structural environmental issues as confounding factors in regards to substance use among youths (Fadzli & Amer, 2014);(Tan, Yen, & Jr, 2009);(Malaysia Assuntha, 2001).

The above-mentioned summarization of the streams and its influences on alcohol use among youth clearly highlights the need for an integrated approach of the ecological factors around youth life cycle and substance use. This form of evidence is not only crucial to reflect the ever-evolving environment but also to address such influences which may differ across multi-ethnic groups in Malaysia (Wan et al., 2005);(Mutalip, Kamarudin, Manickam, Abd Hamid, & Saari, 2014). Regional studies have also emphasised the need for an integrated approach to prevention and interventions based on evidence that highlights distinctions which are noted here (Cook et al., 2013);(Alvanzo et al., 2011);(Sudhinaraset et al., 2016). Therefore, this study aims to reflect certain aspects of youth alcohol consumption patterns, as illustrated in Table 6. It is hoped that the research exploration, focus areas and research questions will promote a better understanding of these streams which will help guide relevant interventions.

An integrated approach mentioned above takes into consideration that different study designs may be required to achieve the study questions as described in Table 6. Hence, the use of a qualitative and quantitative study that reflects a mixed method approach will help to investigate the associated influences and risk patterns through empirical variables that link the youth to their ecological system. Further rationalisation of variables will be discussed in the methodology section.

Table 6: Study conceptual framework

Factor	Explorations	Focused areas	Study Research Question	Operational definitions for variable include
Sociocultural environment	Influences of environmental factors that may be affected by the residential makeup or belonging to an ethnic group.	Explore/identify/describe the accessibility, availability, neighbourhood and societal norms/sanctions that apply to three youth ethnic groups who reside in these five areas	How does the spaces and environment or structures that support the use and misuse of alcohol and other risk behaviours among youth?	-Perceived ease of availability within community settings -Perception of alcohol policy within the country and community settings
Interpersonal	Assessment of the associated risk of alcohol use and its influences observed from family and peers consumption patterns.	Capturing youth risk associated behaviours that are augmented when consumption patterns are at a riskier level	What are the family, friends and peers alcohol consumption patterns; along with its associated risk?	-Drinking patterns of parents, relatives and peers will be explored -Similarly drinking frequency of parents and friends over the last 30 days
Intrapersonal	Assess the demographics and personality	Addressing current youth's demographics vs perceptions of descriptive norms (what do	What are the determinants of youth alcohol consumption	-Drinking patterns of over the last 30 days

	characteristics of youth, in relation to alcohol use.	they know of the current alcohol use patterns among youth) and injunctive norms (their opinions on what's acceptable),	patterns and other associated behaviours? What is the causal relationship between alcohol use and its risk within ethnic groups?	-Drinking frequency over the last 30 days -The frequency of risk factors over the last 30 days (sexual, physical, experience and act of violence, drinking patterns and driving)

The mixed method approach required to address the above-mentioned research questions will be further strengthened with the evidence in the following chapter. Chapter three will illustrate evidence on ecological influences and its impact on youth alcohol consumption patterns, within the timeline of 2000-2015.

CHAPTER THREE: SCOPING REVIEW

This review is accepted as part of a manuscript by the research committee of the *3rd UUM International, Qualitative Research Conference (QRC) 2018. All accepted papers will be published in the proceeding (ISBN) and will be considered for publication in SCOPUS or INDEXES journal. The conference is held from 10 to 12th July 2018 in Melaka, Malaysia. There may be some coinciding information in the thesis chapter; this is to ensure that the chapter could stand alone as a published paper. Efforts will be made to minimize duplication; however, IMRD approach will still be applied here.*

As mentioned in previous chapters, alcohol-related harms among young adults who consume alcohol at a riskier level do encounter challenges with biological, environmental, psychological and social factors that affect them and the society at large. The aim of this chapter is to generate evidence in a scoping review format on ecological influences and its impact on youth alcohol consumption patterns, within the timeline of 2000-2015.

3.1 Introduction

In 2011, the World Health Organization has estimated that there were 2 billion people worldwide consuming alcohol beverage and 76.3 million had an alcohol use disorder (World Health Organization, 2011). Alcohol-related harms among young adults who consume alcohol at a riskier level do encounter challenges with biological, environmental, psychological and social factors that affect them and the society at large (DeWit, Adlaf, Offord, & Ogborne, 2000);(Wechsler & Nelson, 2015);(Hughes et al., 2011). These challenges may be loftier at a youth level; issues such as alcohol-related harms to an individual, family and community at large. Hence, as explained by Lang and Rayner the health behaviours of a community at large impacts everyone collectively (Lang & Rayner, 2012).

Evidence has shown that child usually imitates parents behaviours (Gochman, 2013) and this is no different when the use of substance is observed in a household (Simons, Sutton, Simons, Gibbons, & Murry, 2016);(Hadley et al., 2016);(Hayakawa, Giovanelli, Englund, & Reynolds, 2016). It is a usual inference that a child is first exposed to alcohol consumption through family norms or socialization practices and behaviours (Donovan & Molina, 2011). The ecological aspects of parenting techniques (Barnes, Welte, & Hoffman, 2002), being in a single parent household (Gabel, 1992), parental monitoring and family closeness (G. F. Moore, Rothwell, & Segrott, 2010), all had correlations with the levels of children's drinking behaviours. In addition, families that experience violence, conflicts and liberal attitudes towards substance use, alcohol, and petty crime may also expose children to such risky behaviours that may be seen as cultural and societal norms. In two studies conducted among high school students in Malaysia and Taiwan, there was a significant association between young adolescent consumption patterns against the patterns observed in their households (Wan Rozita, Hanjeet Kaur, & Lim, 2005);(Yeh, 2006).

Other than household practices, young adolescents with parental detachment issues tend to form an attachment to their peers (Catalano & Hawkins, 1996). A study done in Lebanon showed that peers opinion and behaviours seem to be a major contributor towards harmful alcohol consumption practices among youth (Barbour, et al, 2013). Similarly, a review on gender differences and factors

influencing alcohol use, also found that peer deviant behaviours are reinforcer on riskier alcohol use especially among young male consumers (Schulte, Ramo, & Brown, 2009).

Studies throughout the world have shown that gender differences create a unique intricacy among those who consume alcohol at a riskier level; evidence indicates that men are more inclined to have a higher risk of harmful alcohol consumption practices compared to their opposite sex (Helzer et al., 1990);(Hupkens, Knibbe, & Drop, 1993);(Wilsnack, Vogeltanz, Wilsnack, & Harris, 2000). Such risky alcohol consumption patterns are mainly noted among binge consumers even among men in abstinent countries or where low alcohol prevalence is observed within general population (Assanangkornchai, Sam-Angsri, Rerngpongpan, & Lertnakorn, 2010);(Mutalip, Kamarudin, Manickam, Hamid, & Saari, 2014). However, it is important to note that female alcohol consumption patterns have also increased over the years (Mustonen, Metso, Paakkanen, Simpura, & Kaivonurmi, 1999);(Bloomfield, Gmel, Neve, & Mustonen, 2001);(Bergmark, 2004). Therefore, a better understanding of how gender drinking patterns are evolving over time is equally pertinent.

As described above, alcohol consumption patterns do differ in different segments of the population and these differences are driven by culture, ethnic or gender groups which may elevate with certain environmental or social factors. Several studies on ecological theories revolving around alcohol use have discussed and correlated these factors (Vantamay, 2009); (Bogg & Finn, 2009); (Gruenewald, Remer, & LaScala, 2014) to human ecology; that evolve over time (Lang & Rayner, 2012).

The aim of this review is to collate evidence on ecological influences and its impact on youth alcohol consumption patterns. The ecological influences that will be assessed here are a) intrapersonal influences, such as gender and ethnicity; along with, b) interpersonal influences, that interchanges around family and friend's alcohol consumption patterns. This review also aims to address the research gaps in the areas reviewed.

3.2 Methods

This study used computer-assisted searches to collate relevant articles. One large database (EBSCOhost integrated database) was searched. EBSCOhost integrated database includes many relevant databases like Access Medicine, BMJ Journals, Medline Complete, Google Scholar, Pub Med and Science Direct. terms used were i) alcohol* AND use and abuse* AND youth*, ii) ecological influences* AND family* AND peer*, iii) gender* AND differences* AND drinking patterns*, iv) ethnicity * AND differences* AND alcohol. Search terms were slightly altered in order to exploit the database effectively. The searches were limited to English Language articles from 2000 to 2015. Unpublished dissertations were not included. Duplicated findings were removed and remaining articles were reviewed to see if these studies meet the specific criteria set by aims of this review:

- Were there gender differences in alcohol consumption patterns and its consequences?
- How did ethnic groups association differ in riskier alcohol consumption patterns among young consumers?
- What is the impact of interpersonal influences on youth riskier alcohol consumption?

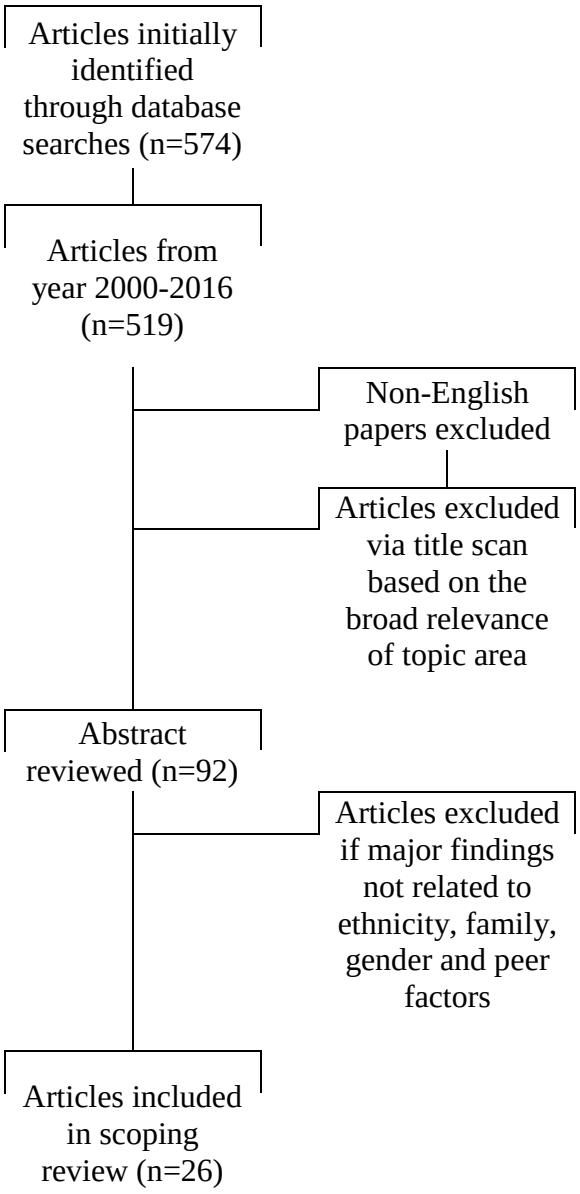


Figure 4: Flowchart explaining search strategy of scoping review

This scoping review is based on the framework proposed by Arksey & O'Malley, 2005; four themes emerged from 26 studies: 8 studies on family influences, 5 on peer influences, 8 on gender

and 5 on ethnic differences are analysed and discussed. Majority of the studies were based in the United States of America, with other studies from Australia, Cambodia, Finland, Italy, Lebanon, Malaysia, New Zealand, Taiwan, and Switzerland. The studies included were mainly cohort (*N*=13) and cross-sectional (*N*=13) studies. Twenty-six studies reviewed here, as listed in Figure 4; are assessed for quality through a consultative process to avoid the risk of bias assessment, with the application of the Newcastle-Ottawa Scale [NOS]. The scores from this scale are listed in Table 7, 8, 9 and 10.

3.3 Evidence from the studies reviewed

3.3.1 Gender differences

Eight studies comprising of five cross-sectional population surveys [including GENACIS project which is done simultaneously in 35 countries] and three longitudinal studies were reviewed for gender-related differences. The age limitation for youth was not applied in this section on gender consumptions analysis; to ensure a comprehensive understanding of the differences between genders in consumption patterns regardless of age. Hence, participants within the age range of 10-70 years old were included. Most studies reported results on gender differences in alcohol consumption, exposure and behaviour. Majority of the studies were conducted in the United States and Australia. Studies from Cambodia, Finland, Hungary and Italy were also included.

3.3.1.1 Intrapersonal Influences

As summarised in Table 1; eight of the studies reviewed here, indicated that there are significant gender differences among women and male consumers. The difference varied from positive to negative factors that are more prominent in male consumers than their counterparts. It is important to note that women may encounter riskier consumption patterns in early adulthood [ages 18-21] or later between the ages range of 35-60 years old. Therefore, it is imperative to ensure gender-specific criteria are amalgamated when interventions or research studies are being explored.

For instance; York et al, in 2003 reported that 46% of 1,232 American women were consuming alcohol daily. Thirteen percent of these women reported a daily consumption of four or more drinks- this, variations in daily consumption ranged from 1 to 30 for men and 1 to 16 for women. This study finding emphasized that age by gender variation was not significantly different over time and frequency of consumption amongst pathological consumers were almost similar among men and women (York, Welte, & Hirsch, 2003).

There is a varied reason as to why and how alcohol consumption patterns differ among men and women. In a study done on 102 social drinkers- alcohol consumption was associated with increased aggression among men (Giancola et al., 2002). Whereby, in a study in Finland; revealed that women associated alcohol consumption patterns to positive outcomes. For example; the women in this study claimed that alcohol consumption made them feel optimistic about life and they felt better even when they had to deal with interpersonal issues at home or at work-places. For the men in this study; they associated alcohol consumption with the socialization factor that built confidence in alluring women. Hence, men perceive hedonistic benefits and women perceived more functional benefits from alcohol consumption (Mustonen et al, 2000).

However, when young women consume alcohol at a riskier level they may experience negative outcomes. A longitudinal study of national representative adolescent data used by Chen and Jacobson in 2012; indicated that greater gender differences in rates of linear change are noted, especially on alcohol use. Basically, this refers to the fact that females tend to show higher levels of substance use in early years compared to their counterparts (Chen & Yin, 2008). Such consumption patterns are concerning because, when females do consume heavily, they are more vulnerable to alcohol use disorders. These, forms of disorders appear to be severe in females compared to males (Nolen-Hoeksema, 2004). In addition to that, other associated riskier behaviours are also closely related to riskier alcohol consumption patterns. For instance, evidence from Cambodian study among 300 youths aged between 10-24 years residing in rural settings – revealed that majority [64%] of female consumers reported vulnerability towards risky sexual behaviours, compared to their male counterparts (Lopez, Mukaire, & Mataya, 2015). Such

vulnerabilities among female consumers are more likely to go unnoticed and undiagnosed in healthcare settings by their physicians (Brienza & Stein, 2002). This is concerning, especially when evidence from Cambodia indicated that females who do seek health interventions, they may do so at a non-medical facility (Lopez et al., 2015).

Therefore, adequate and specific strategies are required to address riskier consumption patterns among females, especially when such consumption patterns prolong to later years. For instance, a study in Italy on 1059 daily consumers, revealed that heavy consumption patterns among females continued until later years (Guerrini, Gentili, & Guazzelli, 2006). Similarly, an Australian study of 14,941 females, indicated that risky consumption and associated problem behaviours continue to escalate among females aged 35 to 65-year-olds (Livingston & Room, 2009).

3.3.1.2 Interpersonal Influences

Gender and associated alcohol consumption patterns also impact a family as a whole. For example, Kelly in 2012 explored the impact of family emotional engagement on adolescent alcohol use and in her findings, she revealed that female emotional closeness to mothers was associated with less frequent alcohol use. This effect appeared to operate by reducing exposure to high-risk peer networks. However, parental disapproval of alcohol use was protective for both genders, but this effect was larger for males than females (Kelly et al., 2011).

A Hungarian study in 2015 indicated that parental socioeconomic status such as mother's education was inversely related to smoking and alcohol consumption among young adults. Whereby, female with father who had high education displayed higher risk behaviours; such association is closely related to the fact that highly educated fathers may have higher permissive attitudes. Once again, emphasising the need that both parental education and active involvement in youth's life cycle, will promote better coping mechanism on how to manage substance use patterns among youth (Piko, Varga, & Wills, 2015).

Table 7: Ecological influences from gender perspective reviewed against assessment scale

Studies	Sample size and method	*	**	Findings relevant to this scoping review	*NOS /10*
1. Developmental Trajectories of Substance Use from Early Adolescence to Young Adulthood: Gender and Racial/Ethnic Differences. (P. Chen & Jacobson, 2012)	Longitudinal Study of Adolescent Health; examined gender and racial/ethnic. A sample size of 20,160 representatives of national data In US. Mean age at 21.2 (for those age 12 to 25)			Alcohol use exhibited the highest rates. • Substance use increased from age 12, reached a stationary point (i.e., the highest level) at about age 25, and then declined. • Females exhibited higher levels of substance use than males during early adolescence.	7
2. Characteristics of youth sexual and reproductive health and risky behaviours in 2 rural provinces of Cambodia. (Lopez et al., 2015)	Multi-staged sampling method, 30 villages- 300 rural youths ages within 10-24.			The frequency of alcohol use between 1–5 times was evident in 90% of youths. • More boys used alcohol than girls (74.2 % vs. 57.7 %) • 77% of female reported risky sexual behaviours when alcohol consumption is observed. • More females 64% reported that they practice risky behaviours than males.	7
3. A Study of Motives for Tobacco and Alcohol Use Among High School Students in Hungary. (Piko et al., 2015)	500 students (age range = 14–20 years; *M* = 16.4, *SD* = 1.31; 34 % males; 99.4 % response rate)			The social norm is a dominant motive for youth and mostly they consume in social situations • Mother's education was inversely related to both smoking and drinking • Level of father education was positively related to drinking among girls.	6
4. Alcohol consumption and heavy drinking: a survey in three Italian villages. (Guerrini et al., 2006)	Information on alcohol-drinking patterns was collected from 2972 individuals using a questionnaire that included a masked form of the CAGE rating scale.			Heavy drinking was significantly higher in females compared to males, but daily drinking was higher in males compared to females. • Out of 1059 consumers, 25% female were daily consumers	6

5. Variations by age and sex in alcohol-related problematic behaviour per drinking volume and heavier drinking occasion. (Livingston & Room, 2009)	Mixed methods to collect data from almost 29,445 Australians aged 12 or older.			Both annual volume and risky drinking occasions peak in the early twenties or late teens. • Total consumption and risky drinking occasion peak at slightly younger ages for females (18–19) • There is a possibility that females are displaying high problematic behaviour at specific levels of drinking (eg 8 or more drinks)	8
6. Gender differences in the impact of families on alcohol use: a lagged longitudinal study of early adolescents. (Kelly et al., 2011)	A total of 855 Australian students (modal age 10–11 years at baseline) participating in the International Youth Development Study (Victoria, Australia).			• For girls, the emotional closeness to mothers led to lower exposure to high-risk peer network and less frequent alcohol use • Parent disapproval of alcohol use was protective for both genders, but this effect was larger for boys than girls.	8
7. Gender comparison of alcohol exposure on drinking occasions. (York et al., 2003)	A representative sample (N = 2,627) of the U.S. adult population was surveyed using computer-assisted telephone interviewing.			• Of the 1,833 current drinkers (73.4% men & 67.2% women), women reported consuming a mean of 2.2 standard drinks (1 drink = 12 g ethanol) on typical drinking occasions (days); men reported consuming a mean of 3.2. • The duration of the drinking episode was similar for women (122 minutes) and men (126 minutes). • The hourly rate of drink consumption was thus lower for women (approximately 1.1 drinks/hour) than for men (approximately 1.6 drinks/hour).	9
8. Relationships of drinking behaviour, gender and age with reported negative and positive experiences related to drinking. (Mustonen & others, 2000)	Interviews were performed with a representative sample of the Finnish population between 15 and 69 years of age.			• For women, drinking helped them to sort out interpersonal problems at home or in the work-place, to feel more optimistic about life, and to express their feelings.(Functional benefits) • Men more commonly reported that drinking had helped them to be funnier and wittier and to get closer to the opposite sex. (Hedonistic benefits)	7

Results focused on:*Ethnic group association and ** Family and peer influences.

In conclusion, Table 7 findings above resonates the fact that normative influences that revolve around riskier consumption patterns do contribute to intense alcohol use among youths. These forms of vulnerabilities were also closely tied to ethnic group composition.

3.3.2 Ethnic group differences

In this section, five studies were analysed. Two of these, are cross-sectional population surveys, and three are longitudinal studies that reviewed ethnic-related differences. The age range for youths was not considered in this section to ensure the appreciation of ethnicity and its associated risk is encapsulated. Hence, studies with age variations of 13 to 70 years were included. The studies reviewed are from New Zealand, Malaysia and the United States of America.

Ethnic group differences are prominent within a multi-racial country such as Malaysia. A study conducted in Kuala Lumpur, involving 8532 students from secondary schools, found that the Chinese students were 1.55 times more likely to consume alcohol compared to other ethnic groups (Wan Rozita et al., 2005). The National Health and Morbidity Survey 2011 in Malaysia also found that current alcohol use is most prevalent among the Chinese. However, riskier alcohol consumptions patterns were noted among local natives from Sabah and Sarawak. Similar risky consumption patterns were also noted amongst the Indians ethnic group with an odds ratio of 1.7 higher than Chinese. It is relevant to note that the national prevalence for the current consumer is at, 24% (95% CI: 21.0, 26.4) and risky drinking patterns are evident. Such consumption patterns are mainly noted among 18-39 years olds (Mutalip et al., 2014).

However, such ethnic differences could also be a beneficial factor for young adults. In a study on 854 young Asian American; revealed that Asian language use was protective against alcohol misuse and alcohol dependence. The study concluded that cultural and socioeconomic factors of problematic consumption could differ for foreign-born Asian American (Cook et al., 2013).

On the contrary, negative factors are also visible among different ethnic groups. A US study revealed that Whites were younger than Blacks and Hispanics of the same sex at drinking onset and progressed to alcohol dependence at a faster rate. This study emphasized the fact that there a significant association in the course of transition that is noted in alcohol initiation to alcohol dependence by race or ethnicity (Alvanzo et al., 2011).

Some of these ethnic differences are associated with the ethnic group association rather than the cultural identity. For instance, a New Zealand study examined the role of Maori ethnic and cultural identity in alcohol use and misuse. The study concluded that although Maories were found to be associated with modestly increased risk of alcohol use and abuse, there was little evidence to suggest that the rates of alcohol use differed in regards to their cultural identity (Marie, Fergusson, & Boden, 2012).

As noted in Table 8; the studies reviewed here, indicate that there is a significant impact of intrapersonal influences on youth consumptions patterns and their ethnic associations. However, there is a need to apply caution to the above-mentioned findings; because other than ecological issues such as family - peer influences; gender and social economic factors are equal contributors to youth alcohol use. Hence, the riskier consumption pattern factors are still undetermined and some of these associated factors are discussed below.

Table 8: Ecological influences that differ between ethnic groups

Studies	Sample size and method	*	**	Findings relevant to this scoping review	*NOS /10*
1. Factors related to alcohol drinking among the adolescents in Federal Territory, Kuala Lumpur. (Wan Rozita et al., 2005)	The two-stage stratified sampling design was used to recruit 8532 eligible students from the selected secondary schools in Kuala Lumpur.			Significant factors were identified related to alcohol consumption, namely the Chinese ethnic group (1.55).	6
2. Alcohol consumption and risky drinking patterns in Malaysia: findings from NHMS 2011. (Mutalip, Kamarudin, Manickam, Hamid, et al., 2014a)	The paper analysed data from the National Health and Morbidity Survey 2011. It was a cross-sectional population-based with two stages of stratified random sampling design. A validated Alcohol Use Disorder Identification Test Malay questionnaire was used to assess the alcohol consumption and its alcohol-related harms.			Ethnicity was significantly associated with risky drinking where Bumiputera Sabah and Sarawak had the highest odds of 2.7 followed by another ethnicity with the odds of 2.1 higher than Chinese relatively. Indian had odds of 1.7 higher than Chinese.	7
3. Who's At Risk? Ethnic Drinking Cultures, Foreign Nativity, and Problem Drinking Among Asian American Young Adults. (Cook et al., 2013)	This study was a nationally representative sample of 854 Asian American young adults extracted from the Wave 4 National Longitudinal Study of Adolescent Health data.			• Asian language use was protective against alcohol-misuse symptoms and alcohol-dependence symptoms for the foreign-born. • Asian Indians consumed the smallest volume of alcohol, followed by the Vietnamese and Chinese/Taiwanese. Koreans were estimated to consume the largest volume of alcohol among all Asian people, followed by the Japanese.	9
4. Race/ethnicity and sex differences in the progression from drinking initiation to the development of alcohol dependence. (A. A. Alvanzo et al., 2011)	This study uses data from Wave I of the National Epidemiologic Survey on Alcohol and Related Conditions (NESARC) to compare a nationally representative sample of White, Black and Hispanic adults 18–44 years of age (n = 21,106).			• Drinking onset is earlier in Whites compared to Blacks and Hispanics. • White tends to progress to alcohol dependence at a faster rate than Blacks and Hispanics.	8

Studies	Sample size and method	*	**	Findings relevant to this scoping review	*NOS /10*
5. The Links between Ethnicity, Cultural Identity and Alcohol Use, Misuse and Dependence in a New Zealand birth cohort. (Marie et al., 2012)	Data were gathered as part of a longitudinal study of a New Zealand birth cohort of 1000 young people. (The Christchurch Health and Development Study).			• Māori ethnic group association lead to higher alcohol-attributed deaths (1.47-1.63) compared to non-Maori people. • Higher consumption patterns were dominant among youth aged 18-21 years old.	9

Results focused on: * Ethnic group association and ** Family and peer influences.

3.3.2.1 Interpersonal influences

A total of thirteen studies were reviewed on ecological factors [with a specific focus on family and peer influences], that were directly and indirectly associated with youth alcoholism. The majority [6 out of 13], studies utilised a longitudinal approach. Other study methodologies include cross-sectional population surveys and Structural Equation Models (SEM). The sample age for participants were adolescent children aged between 6-26 years old, with most of the studies focusing on students in schools and universities. Majority of the studies were conducted in the United States of America, with four other studies conducted in Switzerland, Taiwan and Lebanon.

3.3.3 Family influence

There have been questions about the impact of parental alcohol-related messages and parenting style on alcoholism in adolescents. Zero tolerance communications by parents appeared to be most protective against alcohol use and consequences. Harm minimization messages were noted to be the least effective communitarian strategies. Messaging on the minimization of harms or abstinence were less effective especially among young adults (Abar, Morgan, Small, & Maggs, 2012). Parenting style like monitoring and disapproval of heavy consumption were negatively associated with heavy episodic drinking. Where else, higher levels of perceived monitoring and disapproval were associated with lower levels of heavy episodic drinking. Perceived parental permissiveness was significantly and positively associated with heavy episodic drinking (Wood et al., 2004). Contrary to this, another study explored similarities between youth in different countries with different alcohol policies and they concluded that adult-supervised settings for alcohol use

resulted in higher levels of harmful alcohol consequences (McMorris et al., 2011). This contradicts with predictions derived from the harm-minimization policy.

An interesting study took parental monitoring a step further by examining the potential gender-specific parental influences on consumption control and alcohol-related problems in 581 university students. The study showed that daughters, perceptions of a permissive father were indirectly linked to more alcohol-related problems; while for sons, perceptions of mother and authoritativeness were directly linked to fewer alcohol-related problems (Patock-Peckham, King, Morgan-Lopez, Ulloa, & Filson Moses, 2011).

In addition to parental assent and monitoring approach; parental consumption patterns do have a direct impact on youth drinking patterns as well. For example; paternal alcoholism and paternal absence were associated with the development of behavioural problems amongst youth. These behaviours were explored in a study and the results revealed that a propensity for physical aggression and low anxiety best-distinguished *son of male alcoholics* [SOMAs] from non-SOMAs at ages 6 and 12 years old (Carbonneau et al., 1998). Yeh, conducted a survey on 779 high school students in Taiwan and found that the probability of developing adolescent drinking problem was fourfold greater in students whose fathers had heavy consumption episodes, with males having a probability of 2.22 - 2.71 fold greater than in female adolescents (Yeh, 2006).

Summarization of the results found in the eight of the studies evaluated under family influences shown in Table 9; indicates that it is crucial for parents to have effective and engaging communication on risks associated with alcohol use. Such communication enforcement needs to be tailored to ongoing efforts to build a healthy relationship with a child who is transitioning from adolescent to young adulthood. The transformation from child ecology to young adult life cycle comes with many challenges involving risk-taking practices that could impact alcohol consumption behaviours.

Table 9: Ecological influences, reviewed against assessment scale I – Family influences

Studies	Sample size and method	*	* *	Findings relevant to this scoping review	*NOS /10*
1. Investigating Associations Between Perceived Parental Alcohol-Related Messages and College Student Drinking.(Abar et al., 2012)	A longitudinal study of 585 participants who are less than 21 years completed web-based surveys.			Zero tolerance messages seemed to be more protective compared to harm reduction-based messages. Harm reduction messages were associated with riskier alcohol use in college.	9
2. Influence of Family Factors and Supervised Alcohol Use on Adolescent Alcohol Use and Harms: Similarities Between Youth in Different Alcohol Policy Contexts. (McMorris et al., 2011)	Representative samples seventh-grade students (N = 1,945) were recruited from schools in the US and Australia. Students completed comprehensive annually from 2002(seventh grade) to 2004 (ninth grade).			Adult supervision resulted in higher levels of harmful alcohol consequences contrary to predictions derived from the harm-minimization policy.	8
3. Factors associated with alcohol consumption, problem drinking, and related consequences among high school students in Taiwan.(YEH, 2006)	A total of N=779 10th-grade students from four randomly selected high schools in eastern Taiwan were included in the self-reported survey.			Parents (fathers) and peer groups influenced alcohol consumption. The probability of developing adolescent problem drinking was fourfold greater in students whose fathers had habits of drinking.	6
4. Do Parents Still Matter? Parent and Peer Influences on Alcohol Involvement Among Recent High School Graduates. (Wood et al., 2004)	N=556 participants (late adolescents) completed a mail survey.			Parental monitoring and parental disapproval led to lower levels of heavy episodic drinking.	8
5. Gender-Specific Mediational Links Between Parenting Styles, Parental Monitoring, Impulsiveness, Drinking Control, and Alcohol-Related Problems. (Patock-Peckham, King, Morgan-Lopez, Ulloa, & Filson Moses, 2011)	A multiple-group, SEM model with (316 women, 265 men) university students was examined.			For daughters, perceptions of a permissive father were indirectly linked to more alcohol-related problems, while for sons; perceptions of mother and authoritativeness were directly linked to fewer alcohol-related problems.	7
6. Sibling Influence on Alcohol Use in a Young Adult, High-Risk Sample. (Trim, Leuthe, & Chassin, 2006)	Data from sibling pairs (n = 169 pairs) in an ongoing longitudinal study of children of alcoholics and matched controls were collected at two-time points 5 years apart.			Older sibling influence on younger sibling alcoholism was significant only among sibling pairs who were of the same gender, closer in age, and from higher conflict families	9

Studies	Sample size and method	*	**	Findings relevant to this scoping review	*NOS /10*
7. My older sibling was drunk – Younger siblings' drunkenness in relation to parental monitoring and the parent-adolescent relationship. (Gossrau-Breen, Kuntsche, & Gmel, 2010b)	Regression models were conducted based on a national representative sample of 3725, 8th to 10th graders in Switzerland (mean age 15.0, SD ¼ .93) who indicated having older siblings			Parental monitoring is important in preventing risky drinking in younger children even if older children engage in riskier consumption patterns. However, a satisfying relationship with parents does not seem to be sufficient to counterbalance older siblings' influence.	8
8. The Earlier the More? Differences in the Links between Age at First Drink and Adolescent Alcohol Use and Related Problems According to Quality of Parent-Child Relationships. (Kuntsche, van der Vorst, & Engels, 2009b)	Structural equation models were estimated based on a three-wave, 2-year prospective study of 364 adolescents.			Adolescents those who had a late alcoholic first drink and a high-quality relationship with their parents were found to have lower levels of alcohol use	9

Results focused on:* Ethnic group association and ** Family and peer influences.

3.3.4 Peer influence

An example of peer influence evidence on youth alcoholism is seen when Duncan and colleagues studied 405 randomly recruited youth from three age cohorts (9,11,13 years) and assessed them annually for 4 years. The study showed that more peer deviance and peer encouragement of alcohol use was related to an increase in alcohol use rates from ages 9 to 16 (Duncan, Duncan, & Strycker, 2006a). These, forms of peer influence continued to remain significant for some adolescent who transitioned into young adults. For instance, from 75% [*n*=1036] of youths within the age range of 17-22-year-olds - from different universities in Lebanon; claimed that they usually consume alcohol with their friends. Hence, indicating that their consumption patterns revolved around a peer's opinion and behaviour (Barbour et al., 2013).

In addition to peer pressure, social anxiety is also an important factor for consideration in youth alcohol use. For socially anxious youth, high levels of perceived peer use in relation to high levels of affiliation need to result in greater alcohol use on average and more frequent episodic drinking. Specific to heavy episodic drinking, the interaction between social anxiety and perceived peer

drinking seemed to affect girls and boys differentially. Thus, it was inferred that alcohol-related risk associated with social anxiety might be gender specific (Anderson, Tomlinson, Robinson, & Brown, 2011).

Some studies highlighted protective factors that may co-exist with peer pressure such as school bonding. In a study of 2582 American Indian and Alaskan Native student; school bonding was associated with lower likelihood of lifetime alcohol use for adolescents younger than age 16, and a lower level use among users for all adolescents. Thus, school bonding is seen as a buffer against peer alcohol use among adolescents younger than 16 years old (Dickens, Dieterich, Henry, & Beauvais, 2012).

There is a certain moderating variable effect of peer's use of alcohol on youth alcoholism, namely perceived harm of alcohol use and risk-taking. The effect of increased exposure to alcohol using friends is stronger when the youth is less likely to perceive the harmful effects of alcohol use, or when a youth indicates increased interest in risk-taking behaviours. Hence, although a friend's use of alcohol is a major predictor of a youth's own alcohol use; some are more likely than others to be influenced by a friend's behaviour depending on the perception of harm and predisposition to risk-taking (Henry, Slater, & Oetting, 2005b).

The evidence in this section shown in Table 10; stipulates that alcohol use and misuse are associated with several domains of influence in youth interpersonal ecology. Some predictors of alcohol misuse are closely related to peer opinion and behaviours. These forms of predictors are linked to personal factors like social anxiety, perceived harms of alcohol use and risk-taking behaviour. Therefore, enforcing the need for prevention efforts which encapsulate adolescence, who may be exposed to such risk-taking behaviours from an early age is essential. In addition, there is an equal emphasis to also monitor peer involvements that are equally at risk of alcohol misuse.

Table 10: Ecological influences II, reviewed against assessment scale II –Peer influence

Studies	Sample size and method	*	**	Findings relevant to this scoping review	*NOS /10*
1. Alcohol Use from Ages 9 –16: A Cohort-Sequential Latent Growth Model. (Duncan et al., 2006a)	The sample comprised 405 randomly recruited youth from three age cohorts (9, 11, and 13 years), assessed annually for 4 years.			The greater the peer deviance and friend's encouragement of alcohol use, the greater the increase in alcohol use rates from ages 9 to 16 years.	10
2. Do personal beliefs and peers affect the practice of alcohol consumption in university students in Lebanon?. (Barbour et al., 2013)	A total of 1500 questionnaire were distributed to students from all universities in Lebanon.			Risk factors for harmful drinking were: • friends' agreeing with alcohol consumption (crude OR = 6.22), • a higher proportion of friends who drank regularly (OR = 17.3) and • higher frequency of drinking alcohol with friends (OR = 80.1).	7
3. Friends or Foes: Social Anxiety, Peer Affiliation, and Drinking in Middle School. (K. G. Anderson et al., 2011b)	1,500 early adolescents from southern California completed the Social Anxiety Scale for Children-Revised as well as measures of perceived peer drinking and self-reported lifetime and current drinking.			Youth who are socially anxious had higher levels of perceived peer use which led to greater alcohol use on average and more frequent episodic drinking. For heavy episodic drinking, the interaction of social anxiety and perceived peer drinking seemed to affect girls and boys differentially.	8
4. School Bonding As a Moderator of the Effect of Peer Influences on Alcohol Use Among American Indian Adolescents. (Dickens et al., 2012)	Survey data were collected from middle and high school students during the 2009–2010 and 2010–2011 school years from 37 school districts in the United States. The sample consisted of 2,582 students			Peer alcohol use was seen as a risk factor for • lifetime alcohol use and • level of alcohol use among users. • School bonding led lower likelihood of lifetime alcohol use for adolescents younger than age 16 and a lower level of use among users for all adolescents.	7
5. Alcohol Use in Early Adolescence: The Effect of Changes in Risk Taking, Perceived Harm and Friends' Alcohol Use. (Henry et al., 2005b)	1,065 students were in sixth or seventh grade at the initial survey and provided survey data on three additional occasions over a period of 2 years.			Increased exposure to alcohol-using friends happens when an adolescent is less likely to perceive the harmful effects of alcohol use and when they are prone to risky taking behaviour.	9

Results focused on: * Ethnic group association and ** Family and peer influences.

3.4 Discussion

The aim of this review is to gather available evidence on ecological influences such as family, peer, gender and ethnicity; which, clearly indicates the complexity that revolves around youth riskier alcohol consumption patterns. However, the evidence gathered from twenty-six studies in Table 7,8,9 and 10 emphasised the fact that interpersonal influences – especially positive parental factors, could act as protective buffers in addressing youth alcoholism (Abar et al., 2012);(Wood et al., 2004);(Gossrau-Breen, Kuntsche, & Gmel, 2010a);(Kuntsche, van der Vorst, & Engels, 2009b);(Patock-Peckham et al., 2011);(McMorris et al., 2011). Thus, addressing family-based strategies that improve positive parental involvement in their offspring lives could address riskier alcohol consumption patterns among youth. For instance, prevention strategies packages for parents that encompasses of intrapersonal to interpersonal influences could enhance coping skills that address riskier consumption patterns among young children who transition into young adults (Lopez et al., 2015);(Piko et al., 2015);(Livingston & Room, 2009);(Kelly et al., 2011);(Mustonen et al, 2000);(Wan Rozita et al., 2005);(Abar et al., 2012);(McMorris et al., 2011);(Yeh, 2006);(Wood et al., 2004);(Kuntsche et al., 2009b). This family-based intervention model that comprises of distal and proximal factors needs to be packaged in the interactive and integrated package. Such package, could elaborate zero tolerance messages, with added mechanism on improving parental monitoring and positive relationship that have proven to the best approach to minimise riskier consumption patterns among youths (Abar et al., 2012);(Wood et al., 2004);(Kuntsche, van der Vorst, & Engels, 2009a);(Velleman, Templeton, & Copello, 2005). Some of the elements of an interactive intervention package that takes into consideration the transitions that occur in a child's life to young adulthood; is described in Figure 5.

In addition, to the above mentioned interactive package; there is also a need to include associated factors that correlated to intra and interpersonal influences. For instance, ethnic group association, gender and peer influences could all be contributing factors to riskier consumption patterns (Patock-Peckham et al., 2011);(Duncan et al., 2006). Thus, emphasising the need on continuous research to address the riskier alcohol patterns which may be evident among families from a certain ethnic group (Mutalip et al., 2014);(Cook et al., 2013);(Alvanzo et al., 2011);(Marie et al.,

2012);(Chen & Jacobson, 2012);(Lopez et al., 2015);(Livingston & Room, 2009);(Kelly et al., 2011);(Mustonen et al, 2000). These forms of influences could also be closely linked to the genetic makeup of youth from specific kinship (Kendler, Myers, Dick, & Prescott, 2010), social or cultural factors (Marie et al., 2012).

Therefore, Stokols guideline on Social Ecology Model for Health Promotion; which addresses human-environment interactions that involves individual, families and cultural groups prevention and intervention may be a suited approach (Stokols, 1996);(McLeroy, Bibeau, Steckler, & Glanz, 1988);(YEH, 2006);(Gossrau-Breen et al., 2010). The following figure 5, demonstrates the need for positive reinforcement messaging from parents that are mapped against the growth chart of their offspring.

<table>
<tr><td rowspan="8">Family Influences on youth alcohol use:
"Parents promote abstinence messages"</td><td colspan="2">Adolescence

<18</td><td colspan="2">Youth

18-25</td></tr>
<tr><td>Male</td><td>Female</td><td>Male</td><td>Female</td></tr>
<tr><td colspan="2">Parents promote abstinence messages</td><td colspan="2">Parents promote abstinence with information on benefits and risk associated with alcohol usage</td></tr>
<tr><td colspan="4">Parents consume alcohol responsibly in front of children

(Male not more than 4 drinks at a sitting and female not more than 2 at a sitting; over a period of two to four hours)</td></tr>
<tr><td colspan="2" rowspan="3">Parents to build a strong relationship with constant probing to assess knowledge on possible risk factors resulting from substance use</td><td>Fathers or Male family members</td><td>Mothers or female family members</td></tr>
<tr><td colspan="2">to also address knowledge on potential risk associated with harmful consumption and another risk (ex; sexual, violence & drunk driving/riding)</td></tr>
</table>

Figure 5: Positive reinforcement messaging cater to parent interactions with their offspring

3.5 Research Gaps

As highlighted above, there is a need to build on evidence to ensure interactive intervention packages are catered and directed at the right audience at a specific timeframe.

- The packaging of interactive messaging that focuses on family-based interventions; parents address the protective factors, risk factors and resilience via communication. Parent to build a positive relationship with a child through adolescence and youth. However, such messaging needs to also be mapped against the current gaps identified in relations to gender-specific parental influence.
- Addressing interpersonal influences, which are interwoven with the peer's influence on alcohol consumption, should be explored. This might help in tailoring intervention to a certain group of youth who possess specific personal factors which separates them from the high-risk groups.
- Research is also required on the convergence of men's and women's consumption patterns. Evidence highlighted above have indicated that there is an increasing trend of alcohol consumption among females that revolves around evolution in women's lives (Holmila & Raitasalo, 2005). It is crucial to highlight the fact that there is limited research on addressing alcohol consumption patterns within females especially in South East Asia. This form of evidence is crucial since there is an increase in the average volume of drinking among women residing in this region (Das, Balakrishnan, & Vasudevan, 2006).
- Finally, the relationship between ethnicity and consumption patterns is critical in addressing its risk and protective factors. These forms of tailored information could inform prevention and intervention activities.

3.6 Conclusion

In relation to the ecological factors that influence youth alcoholism, this review found that intra and interpersonal influences were so inextricably linked to one another. Hence, a multidimensional

approach through a primary prevention package needs to be developed for parents so that they could strategically address riskier alcohol consumption patterns among youths.

In addition, studies on gender highlighted the differences in drinking patterns between genders and consumption consequences. The incidence of heavy and problematic consumption seemed to have significant gender differences that are important to consider when planning effective prevention programmes. The gender-specific parental influences should also be considered when planning an intervention.

Finally, this review also revealed that ethnicity and cultural identification are relevant factors to be considered in studies on riskier alcohol use. Hence, more studies relating to risk and protective factors of specific ethnic groups in particular locale are warranted. This ensures the fact that ethnic group associations are integrated into prevention and intervention initiatives.

3.7 Limitations

Unlike previous reviews which focused on broader aspects, this review has specifically discussed the intra and interpersonal ecological influences of riskier alcohol consumption among youth. However, the 26 studies in this scoping review have been cross-sectional and longitudinal studies from specific countries only; thus, this limits our understanding of temporal patterns of alcohol consumption among individuals in varied age range. Furthermore, the author intended to encapsulate some Asian population studies to ensure regional differences- but, only five studies were included that were aligned with the aims of the review.

CHAPTER FOUR: METHODOLOGY

4.1 Background

As described in chapter one, the study aimed to explore youth alcohol consumption patterns and its associated risk factors among the three ethnic groups in Malaysia. Whereby in chapter two, emphasize the need to apply multiple levels of investigation which will address the dependent variables [i.e.: ever, current, or binge consumer] and the relationship of independent variables [i.e.: interpersonal influences-family or friends; and intrapersonal influences-personal attributes]. Hence, the previous chapter reviewed twenty-six studies evidence confirms that the independent and dependent variables mentioned here are all important components of investigations when alcohol use among youth is explored.

The exploration is mainly dependent on the fact that youth alcohol consumption patterns are observed in the geographical localities/ neighbourhood where the youth reside in. As a multi-ethnic and multi-cultural society, there are some cultural norms which influence residential preferences. Thus, the use of the space within residential/ neighbourhood areas is reflective of the preferences or needs of the majority ethnic group who resides there (Husin, Malek, & Gapor, 2012);(Rahman, Omar, & Salleh, 2012). These forms of preferences can be dependent on social needs; such as personality characteristics, perceived quality with physical comfort offered in the area they reside. A major consideration factor is also dependent on the economic factor which is attached to the labour force, income distribution, corporate ownership, etc. (Teik, 2005).

However, when youth leaves their home to pursue higher education; there is a high probability that they would prefer residential areas that are around their academic institutions or at housing localities that caters to students (Khozaei, Ramayah, Hassan, & Surienty, 2012).

Residential environment is a factor for consideration; since, evidence has indicated that alcohol outlet density in communities may impact young adults consumption patterns (Chen, Grube, & Gruenewald, 2010);(Gorman, Speer, Gruenewald, & Labouvie, 2001);(Farrell & White, 1998). Similar, concerns are also highlighted by local evidence; in which studies have emphasized that there is a need to generate evidence

on accessibility and availability of alcohol within a local context (Mohd et al., 2015);(Maniam, 1994);(Kortteinen, 2008).

Therefore, the specific focus of this study is illustrated in table 11. The study exploratory process is primarily based on understanding the accessibility and availability of alcohol and its impact on youth's ecology. Youth ecology in these aspects refers to the influences that may impact youth alcohol consumption. Ecology in this study refers to socio-environmental, normative and intrapersonal influences. Relevance and association of the ecological influences are discussed in chapter two of this thesis. In summary, the availability of alcohol, individual risk factors and friendship; along with family influences are all important explorations that would contribute to understanding risky alcohol consumption among the youth in Malaysia.

Primarily the study objective is to:

- Assess the influences of environmental factors that may be affected by the residential make-up/neighbourhood up or belonging to a certain ethnic group.
- Assess the intrapersonal factors and associated risk, about youth alcohol use.
- Assessment of the associated risk of alcohol use and its influences observed from family and peer's consumption patterns.

The conceptual framework along with the study focused areas, questions, method and tools are briefly described in Table 11 below:

Table 11: Description of study focused area, questions, methods and tools

Influences	Focused Area	Study Questions	Method & tools
Socio-environmental	Accessibility, availability, neighbourhood and societal norms/sanctions associated with alcohol use.	*How does the spaces and environment or structures that support the use and misuse of alcohol and other risk behaviours among youth?*	Ethnography • **Field Observation** (at six sites) • **Opinions and drunkenness survey** (207 youths) • **Store Observation Tool** (151 stores/service providers & 31 unstructured interviews with community members, service providers & enforcement officers)
Intrapersonal	Youth's demographics vs perceptions of descriptive norms (what do they know of the current alcohol use patterns among youth) and injunctive norms (their opinions on what's acceptable and what are the norms that are practised or observed within certain ethnic groups)	*What are the determinants of youth alcohol consumption patterns and other associated risky behaviours?* • *Ethnic groups?* • *Male & female?*	Self-administered questionnaire • **Opinions and drunkenness survey** (207 youths) • **Youth Risk Behavioral Survey** (326 youths) • **Semi Structures face to face Interview** (40 youths)

Influences	Focused Area	Study Questions	Method & tools
Interpersonal	Assessment of the associated risk of alcohol use and its influences observed from family and peers consumption patterns.	How are risk factors augmented when family or friend's consumption patterns are noted?	Self-administered questionnaire • **Opinions and drunkenness survey** (207 youths) • **Youth Risk Behavioral Survey** (326 youths) • **Semi Structures face to face Interview** (40 youths)

Results from the dependent and independent variables from this study can be utilized to design effective and comprehensive youth alcohol policies (Brook, Morojele, Brook, Zhang, & Whiteman, 2006); (Barrett & George, 2005). These types of strategies should be guided by informed and in-depth knowledge of the relevant ecological factors that influence alcohol consumption at the different levels of drinking behaviour.

4.2 Study Phases

This study will deploy mixed method investigation that aims to encapsulate the associated influences and risk patterns through empirical variables that address the links between predictors [personal attributes, parental, peer and cultural influences] which play a significant role in the initiation or continues misuse of alcohol among youth. It's hoped that the combination of methods of observation (which is done with the use of ethnographic mapping and observation in phase one of study), self-reporting (in phase two) and face to face interviews (in phase three) would provide valuable insights on local youth alcohol consumption practices. Mixed method approach has been used in various studies that help capture critical realist epistemology of youth consumption patterns (Visser & McDonnell, 2012);(Moreno, Cox, Young, & Haaland, 2015);(Bryant et al., 2006);(Goebert, Else, Matsu, Chung-Do, & Chang, 2011). It is hoped the three phases of the study will reflect real-life contextual understanding, multilevel perspective and some insights of sensitive cultural or social constructs that are observed within the local context ("Drinking and social decadence: Separating facts from myths", 2017);("Alcoholism an underrated social problem", 2016); (Lasimbang et al., 2017);("It's official! Legal drinking age now 21", 2016).

4.2.1 Phase one: Qualitative approach

The methodology in this phase of the study also forms part of a manuscript, which is published with 3rd UUM International, Qualitative Research Conference (QRC) 2018. The manuscript titled "An ethnographic mapping of alcohol accessibility in different ethnic communities residing in urban and semi-urban areas within Klang Valley, Malaysia" - if accepted will be published in the proceeding (ISBN) and could be considered for publication in SCOPUS or INDEXES journal.

The first phase of the study used ethnographic mapping. Ethnographic mapping is a technique which is both a research method and a product. It is typically a qualitative approach that is based on direct observation (Silverman, 2013);(LeCompte & Schensul, 2010). The purpose of applying ethnographic research is centred on two goals: (i) understanding the social and cultural problems in communities/institutions- since sensitive

social and cultural norms do apply to all ethnic groups in a Malaysian context (Substance Abuse Prevention and Control, 2016);(Steinka-Fry, Tanner-Smith, Dakof, & Henderson, 2017);(Mohmamed, Marican, Nadiyah, & Yahya, 2008) and (ii) using the research to develop and assess approaches on solving problems or bringing about positive change in institutions and communities (LeCompte & Schensul, 2010);(Flynn & Wells, 2014).

Ethnographic mapping has been used in many global studies to gauge the social and environmental influences on youth alcohol use (Jørgensen, Curtis, Christensen, & Grønbæk, 2007);(Farrell & White, 1998);(Gorman et al., 2001). There are benefits of using ethnographic mapping within the local context. For instance, one of the effective ways of monitoring alcohol consumption at a national level is to monitor per capita alcohol sales within general population (NIAAA, 2011);(Brand, Saisana, Rynn, Pennoni, & Lowenfels, 2007);(WHO, 2014b). However, this form of monitoring could be superficial especially in a predominantly Malay-Muslim country like Malaysia, where the abstinence level is at 90% (WHO, 2004). Such high abstinence levels have resulted in a limited emphasis on public health interventions or policies in Malaysia (Jernigan & Indran, 1997);(Malaysia Assuntha, 2001);(Lasimbang et al., 2017);(Fadzli & Amer, 2014). Therefore, riskier consumption patterns among the general population, minority Indians or subpopulation of the Chinese and the youths go underreported. Local evidence on alcohol use and related morbidity is only captured within health settings, where these types of incidences are accompanied by poor health outcomes (Kortteinen, 2008);(Maniam, 1994);(Lasimbang et al., 2017);(MIROS, 2012);(Assuntha, 2001);(Fadzli & Amer, 2014);(Williams et al., 2014);(UNODC, 2014). Some of the evidence has highlighted that riskier consumption patterns among the youth are rising (Mutalip, Kamarudin, Manickam, Abd Hamid, et al., 2014a);(Wan et al., 2005);(Manickam, Mutalip, Kamaruddin, & Sabtu, 2014);(Mohd et al., 2015). However, the evidence is primarily based on data that is obtained from the school or university students. This form of evidence may contribute to a broad sense of the behaviour, but there are significant shortcomings in the studies and the degree to which they inform any question about youth alcohol consumption. Except Manickam 2014, all other local evidence relied on large, government surveys, and did not focus on youth. In an environment where it is illegal for the majority Muslim population to consume alcohol, such a methodology almost certainly carries a downward bias. Furthermore, in some cases (e.g. Cheah, 2015) Malays were explicitly excluded from the analyses, further affecting a complete understanding of the behaviour. Manickam focused his finding on adolescent aged 12 to 17 years of age in school settings and emphasized the fact that the social sanctions on alcohol use, may contribute to

underreporting (Manickam et al., 2014). Also, the survey did not capture broader family-peer associations with drinking behaviour and suffered a potential bias because it was done in formal school settings.

Based on the above justification, consumption patterns differ among youth in three major ethnic groups in Malaysia and it is a growing phenomenon among this subpopulation. Thus, it is hoped that an ethnographic mapping that initially reflects the accessibility and availability of alcohol within areas youth reside in will be useful. This form of qualitative approach will provide in-depth knowledge of the habitat of the local youth when alcohol consumption is being considered.

Nevertheless, it is important to note that there is a need to apply caution in capturing accessibility and availability information in ethnographic mapping. For instance, the economic environment of the supplier or producers of alcohol is heavily dependent on the profits or loss of individuals/business ability in sustaining such services/supply. Also, the current economic challenges in Malaysia have impacted the commercial segment (BNM, 2015); where several small business entrepreneurs are establishing business sites that may close over a short period of time. In addition, regulatory and social sanctions of alcohol within Malaysian context impacts the ability of producers or service providers to sustain their business in a long run (Bavani & Lim, 2015) (IAS, 2001). Hence, replicability on access and availability of alcohol sales and services within the certain residential neighbourhood is difficult to validate over time.

Step 1: Sites Identification

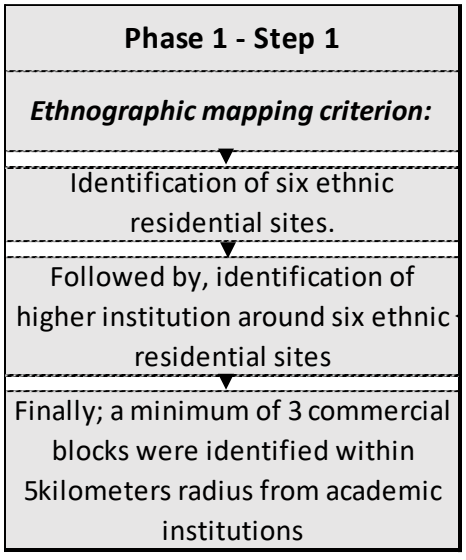


Figure 6: Criterion on sites identification used for ethnographic mapping

In order to address, the above-mentioned limitation the researcher applied varied processes in ethnographic mapping. As shown in Figure 6 above, the ethnographic mapping adopted multiple levels of criterion to select research sites. First mapping criterion was based on the identification of respective ethnic residential sites. The initial step was to review the 2010 National Population and Housing Survey (NPHS) data. The NPHS in 2010 was based on a population density of 86 persons per square kilometre (DOSM, 2010).

The study is based in the large conurbation within Malaysian city of Klang Valley area; which is a larger segment of the area surrounding Kuala Lumpur, that is covered by ten municipalities which are also densely populated with 7.2 million people (Kushairi, 2017). These form of densified municipalities areas are surrounded by communal and recreational facilities in central commercial blocks. These commercial blocks, serve to bring people together in shared activities (State, n.d.). For this study purposes; the communal areas with low-density of a certain ethnic group that ranged within 1,000-5,000 will be considered as semi-urban site and high-density areas that are above 5,000 are identified as urban areas.

Identification of research sites: Once the identification of semi-urban and urban areas of a certain ethnic group is classified; the researcher applied a second selection criterion that identifies higher education institutions within a five kilometres radius from the selected communal areas. This is a necessary criterion, because youth may select living in spaces that were within close proximity to their educational or work sites (Leh, Mansor, & Musthafa, 2016). Based on the academic institution mapping; the third criterion was applied to identify a minimum of three commercial blocks within the selected communal areas. The selection of three commercial blocks with sample size estimates on youths is described in Appendix 2.

Once the commercial blocks are identified, the researcher mapped out food and beverage locations that were frequented by youths. The identification of respective locations is borrowed from Spradley in 1980. He described observations that help to explore/identify the spaces and environment or structures that support the use/misuse of alcohol and other risk behaviours in areas where youth congregate (Leh et al., 2016);(Gruenewald, 2007);(Spradley, 1980**).** Spradley's observational method was useful since it specifically addresses the structural elements that are reflective of consumption behaviours and provided a quick overview of how to quantify the accessibility and availability of alcohol within these sites. Even though the temporal relationship between accessibility and availability that impacts youth consumption patterns may be tough to determine; this process was helpful to observe consumption behaviours within respective communities. As described by LeCompte and Schensul the validity of ethnographic research can

be difficult but various measures and triangulation efforts have been taken into consideration to avoid bias in reporting (LeCompte & Schensul, 2010).

Each commercial block was assigned with a unique identification code as described in Table 12 below. This process was essential to ensure anonymity in the data collection processes. It is important to note here; that the datasheet on several localities that sell/serve alcohol cannot be shared with any third party other than the research team. The datasheet comprises information on the communal areas, commercial blocks and street address that identifies each producer/seller/supplier of alcohol in respective research sites. Due to social sanctions on alcohol use by a certain ethnic group in this country, this type of information is sensitive and protection of privacy of these localities is merited. If required, data sharing can be considered if the terms of a data sharing agreement adhere and if the rights and privacy of the provider/sellers/suppliers are protected.

Table 12: Sites classification, identification codes and population size

Site	Unique ID & description on population size (for selected sites)	Description of selected urban/semi agglomerations area
Setapak (urban Malays)	STP:M/UR/01/001: Approximately 152,505 Malay residing in Setapak. 17% of youth (age 15-29) Est = 25,925. Within each age range 25,925/14= 1,825. 18-25 are Est at 14,816. 10 metropolitan sites identified {14,816/10= 1,482 youths at respective metro sites}. 3 metro sites were selected, hence sample size for Malay youth 4,446	{area of 62 square miles (160 km2)} In the middle of Setapak is the township of Wangsa Maju [source: NPHS data]. Assessed on 15.10.14].
Petaling Jaya (urban Chinese)	PSS: C/UR/02/001: Approximately 160,652 Chinese and estimated no of youth (age 15-29) 17% (27,311 youth): with the age of 15-95 =27311/14=1,951 youth. {1951/85= 23 youths at respective metro sites}. 23x3 = sample size of 69 youth	{97.2 square kilometres (37.5 sq mi)}. Central Business District of Petaling Jaya with the landmark Menara MBPJ as a focal point [source: NPHS data].
Batu (urban Indian)	BKL:I/UR/03/001: Approximately 48,175 Indian and estimated no of youth(age 15-29) 17% (8,190). 8190/14 of youth age 15-29=585 youth in each age range. 18-25	Batu constituency includes Sentul. Sentul Raya is a new township located in the proximity of Sentul in Kuala Lumpur, Malaysia. Bandar Baru Sentul is

Site	Unique ID & description on population size (for selected sites)	Description of selected urban/semi agglomerations area
	=585x8=4,680 youth within the age range of 18-25. {4680/28= 167 youths at respective sites}. At 3 metro sites, there were 167x3= 501 sample size of the youth	located next to Sentul Raya [source: NPHS data]. Mapping of area-km actual will be done onsite.
Cheras (semi-urban Malays)	CSL:M/SUR/011/001: Approximately 1,219 (semi urban.5000) Malay residents in Cheras. 17% youth (age 15-29) Est = 207. Within each age range 207/14= 15. Hence, 18-25 are Est = 120 youth at @ Metropolitan sites {120/12= 10 youths at respective sites}. 3 metro sites we selected 3x10= 30 Malay youth sample size	Pusat Komuniti Bandar Tun Razak which is located at Taman Mulia [source: NPHS data]. Mapping of area-km actual will be done onsite.
Cheras (semi-urban Chinese)	CSL: C/SUR/022/001: Approximately 4,910 Chinese (< among all others because the semi-urban site is below 5,000 markers) and estimated no of youth (age 15-29) 4,949 all ethnicities. 17% youth age 15-29 =835/14=60. Hence, 18-25 age youth are 60x8=480 per site. 480/12 metropolitan sites= 40 youths at 3 respective metro sites= 120 Chinese youth sample size	Bandar Tun Razak. [source: NPHS data]. Mapping of area-km actual will be done onsite.
Ampang (semi-urban Indian)	ASL:I/SUR/033/001: Approximately 3482 Indian & estimated 17% of youth (age 15-29) = 592/14= 42. 42 youth from 18-25yrs old 42x8=336 {328/10 metro sites= 34 youths at respective sites}. 3 metro sites = 34x3 = this site sample size of youth is 102 youth	Pandan Jaya and Pandan Indah. [source: NPHS data]. Mapping of area-km actual will be done onsite.

Step 2: Field Observation

Once the localities were identified; Cohen's store observational tool was used to document localities placement of alcohol and promotional adverts of alcoholic beverages in outlets within respective research sites (Cohen et al., 2007). The applicability of this tool in the US and its reliability findings was taken into consideration before it's applied in local context. Some adjustment and simplification were necessary, to ensure that local localities representatives were not intimidated when such tool was administrated. The adapted version is available here as Appendix 3. There was a need to apply some form of diplomacy when this tool was administered at respective localities. An overview of the study, with detailed information of anonymity process, was assured to vicinity representatives because some of these representatives believed that they might face legal implication if such information was shared with others. Thus, verbal consent was obtained from the vicinity owner or manager before the tool is administered. This consent process was beneficial for the researcher. An unexpected outcome resulted in voluntary sharing session by vicinity owners, managers and staff that provided information on selling process, buyers profile and their observation on youth consumption patterns within the communities they operated. The criterion processes are reflected in Figure 7.

Other than the spatial dimension, observation and interactions that took place when the store observation tool was administered; it was evident that there is also need to capture youth's perspective on alcohol use within their neighbourhood. Such information was necessary since youths were observed loitering around off-premises retail outlets or even supermarkets in which alcohol is sold.

The site identification and application of store observational tool reflected cyclic iterative process, which is used in ethnographic mapping. This process encapsulates the observation, interactions and quantitative data on youth's day to day behavioural patterns around alcohol use and how this impacted youth's ecology (Whitehead, 2005). Also, the cyclic iterative process was used to avoid self-bias in understanding or interpreting the findings. The next step in ensuring a cyclic iterative process was to capture youth's perspective on alcohol use within their neighbourhood.

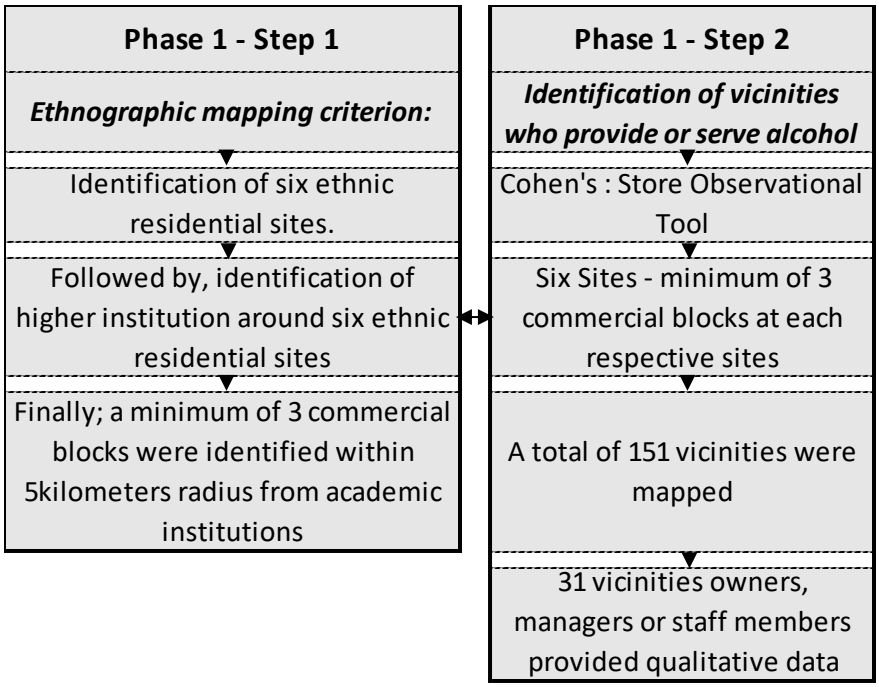


Figure 7: Ethnographic mapping criterion at various stages

Step 3: Self-Administered Survey

As highlighted earlier, the application of store observational tool was challenging. One of the challenges was to assure anonymity of the information gathered. Thus, a non-confrontational approach was required to approach youth to provide their perspective on alcohol use within these sites. Keeping this in mind, I applied an adapted version of opinions and drunkenness self-administered survey; that was developed by Health Promotion Agency, in Wellington, New Zealand in 2013 (Health Promotion Agency, 2013). This tool was adapted to ensure a non-confrontational approach is applied to probe the opinions and behaviours of youth around alcohol use. This form of approach is necessary; as described by Seddon and Ahmed in their book on "Muslim youth; challenges opportunities and expectation", it is important to ensure that the majority youth in Malaysia are not impeded by the Muslim integrity and religious fidelity (Seddon & Ahmad, 2012). Therefore, this questionnaire which comprises of twenty questions; explored demographic characteristics, intrapersonal, interpersonal and environmental factors around alcohol use. At an individual level, questions are directed at exploring perception and awareness of alcohol use within their residential areas. As for the interpersonal explorations; questions explored the issues around family and peer's

knowledge or norms around alcohol use. As for the environmental factors; questions were posed to assess youth awareness of legal implications and accessibility factors around alcohol use. The self-administered survey was distributed to youths at respective sites (*target to reach 25 males and 25 females from each of the six areas*). Due to the multi-ethnic origins of participants, the questionnaire was written in English and translated into Bahasa Malaysia[4]. Most of the Malaysian youth have obtained academic qualifications from public schools; hence, they can understand and read both these languages. However, participants were provided with options whether they would like to respond in English or Bahasa Malaysia questionnaire. The consistency of the questions in dual language was checked by native Malay speaking academic members; who also ensured that the forward and back translation were tested. Pilot testing of the tool was carried out to ensure the reliability and consistency of the adapted version. The pilot testing comprises of the face[5] (Bolarinwa, 2015) and content[6] (Kelley, Clark, Brown, & Sitzia, 2003) validity. In addition, the reliability analysis using Cronbach Alpha; which recorded a result of 0.848. This is deemed reliable as it exceeded the threshold of 0.7 (Nunnally, 1978). This self-administered survey is available in Appendix 4.

Based on the ethnographic mapping activity described above; youths from respective ethnic groups were approached at urban/semi-commercial blocks. Informed consent was obtained before the self-administered questionnaire was administered. Probability (*ethnic representation, youth within the age range of 18-25-year-old, residing within the residential areas*) and convenience (*once selection criteria were met, youth interest in participation is explored*) sampling method was applied. At each site, I aimed at recruiting 100 (*100 = 50 male and 50 females x 6 sites = 600*) youth. Hence, the total of 600 youths was approached, and the final number of youth who completed the questionnaire was 207. A response rate of 34% is attained. A complete overview of the methodology applied in phase one is illustrated in figure 8.

[4] The official language of Malaysia.

[5] Face validity is established when an individual (and or researcher) who is an expert on the research subject reviewing the questionnaire (instrument) concludes that it measures the characteristic or trait of interest. In this context the face validity was done by two academics, one expert in clinical psychologist (PU-RCSI) and the other expert in substances use (USM Penang, Malaysia).

[6] Questionnaire is tested on a pilot sample of youth representing the target population. This process will allow the researcher to identify whether respondents understand the questions.

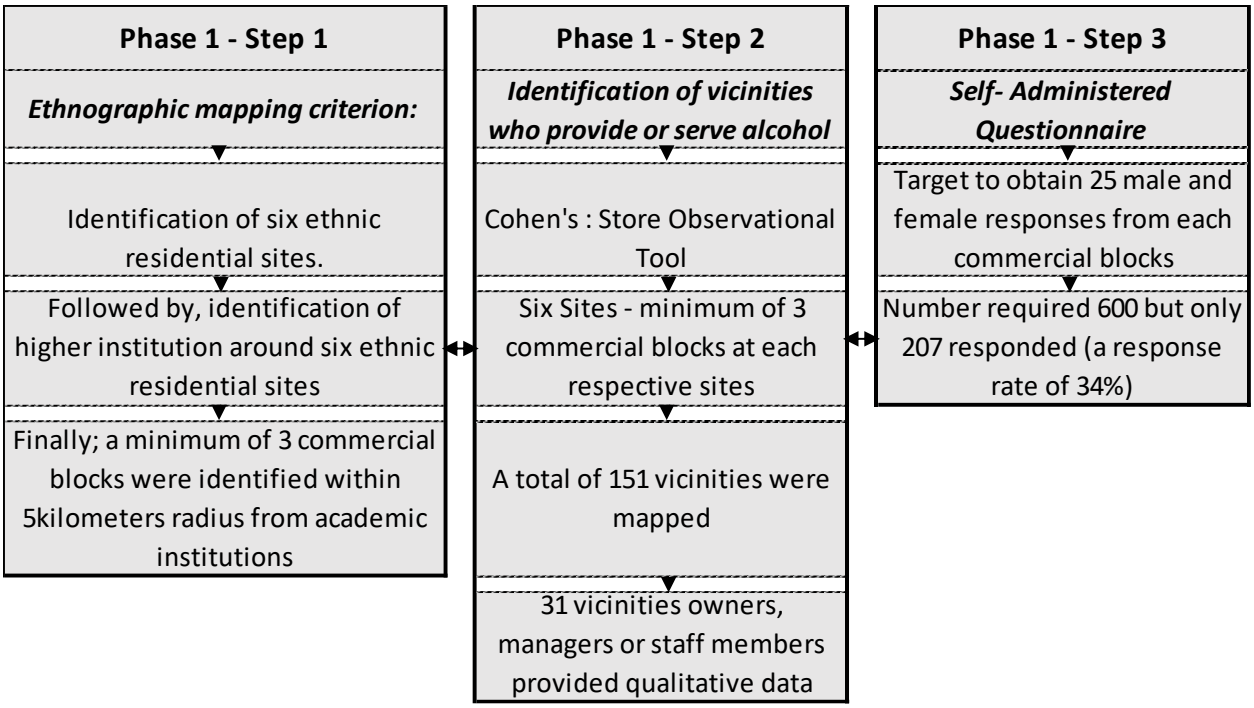


Figure 8: A complete overview of the methodology applied in phase one

4.2.2 Phase two:

Explorations from the above led to preparatory steps in phase two of the study. The methodology adopted here is part of the published paper in the International Journal of Adolescent Medicine and Health; "Ecological perspectives on youth alcohol consumption in the Kuala Lumpur conurbation: a place-based study in Malaysia". DOI: https://doi.org/10.1515/ijamh-2017-0062

In this phase of the study; the researcher used the Youth Risk Behaviour Survey (YRBS) – developed by The Centers for Disease Control and Prevention (CDC) to explore risk associated behaviours and alcohol use. The intention is to collect data using a methodology that might draw out the ecology of youth drinking behaviour, identifying the relationships that supported drinking, without necessarily providing nationally representative point estimates. Therefore, the use of YRBS is mainly aimed at monitoring priority health risk behaviours that are closely related to alcohol consumption among youth. The researcher wanted to ensure that local youth were familiar with a tool that has been used in Malaysian schools since 2009. It is hoped that the use of a familiarised tool would also address the perceived social sanction and stigmatization on alcohol consumption patterns within the local context. Such, measures were also necessary to address issues which may hinder the response rate. It is important to note that issues on underreporting and accuracy

of self-reporting within a stipulated timeline need to be taken into consideration especially within young adults because this may have direct implications on social desirability biases (Armijo-Olivo, Stiles, Hagen, Biondo, & Cummings, 2012);(Roesenbaum, 2009). Thus, minor adaptations are applied to this tool with an emphasis on alcohol consumption patterns that also explores parents and peer's consumption patterns. This tool has been validated by CDC and rationale of each question is also available on CDC website[7]. The method of validating the questionnaire that was applied in Step 3; was also utilised here. Hence, face and content validity from field experts and target group were taken into consideration before the questionnaire was finalised and administered. Details of the questionnaire are provided below.

YRBS Questionnaire

The questionnaire consisted of questions that explored social demographic characteristics such as age, gender, ethnicity and level of education. The following section explored risky behaviours which included questions on smoking, and behaviours which may result in unintended pregnancy, sexually transmitted diseases and contribute to unintentional injuries and violence. The association between alcohol consumption and the following variables are assessed:

Smoking: "During the past 30 days, how many days did you smoke cigarettes?" Youths who reported that they had smoked cigarettes at least one day during the past 30 days prior to completing the survey is categorized as smokers. Non-smokers were the reference group

Ride in alcohol car: "During the past 30 days, how many times did you ride in a car or other vehicle driven by someone who had been drinking alcohol?" Those who responded at least one time are categorized as "Yes".

Drive in alcohol car: "During the past 30 days, how many times did you drive a vehicle when you had been drinking alcohol?" Those who responded at least one time are 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 are categorized as "Yes".

[7] The Youth Risk Behavior Surveillance System (YRBSS) monitors six types of health-risk behaviors that contribute to the leading causes of death and disability among youth and adults. https://www.cdc.gov/healthyyouth/data/yrbs/index.htm

Date that resulted with physical injury: "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".

Injured in a physical fight: "During the past 12 months, how many times did someone whom you date 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 are 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 are categorized as "Yes".

Forced sexual things: "During the past 12 months, how many times did someone whom you date or go out with force you to do sexual things 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 are 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 is grouped into one or less risky behaviour (reference group), 2 to 3 risky behaviours and 4 and more risky behaviours.

Classification of alcohol consumption patterns

From 2012 to 2015, the local government adapted classification on alcohol consumption patterns as per the following table 13.[8]

Table 13: Alcohol units and classifications

Units		Classification
Minimum of 2 drinks	Daily	Low risk
3-4 drinks		Moderate risk
More than or equal to 5		High risk
< 15units	Weekly	Low alcohol drinking
>15units or more		Moderate to heavy alcohol drinking
6 drinks (on one occasion)	Binge	Binge drinking for both male and female

Within Malaysian context, one standard drink of alcoholic beverage contains 10g of pure alcohol.[9]

In this study, alcohol consumption is categorised into three patterns of ever-drinker, current drinker and a 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 30 days before completing the survey – not inclusive of a binge drinker. "Binge drinker" was defined as those who had consumed five or more alcoholic drinks over a period of couple hours in the last 30 days before completing the survey. This definition is also used by The Malaysian, Institute of Public Health, in the Third National Health Morbidity Survey (NHMS III).

[8] Institute of Public Health (2008), The Third National Health Morbidity Survey (NHMS III) 2006, Putrajaya, Ministry of Health Malaysia.

[9] Malaysia KK (2013). *GARIS PANDUAN SARINGAN DAN INTERVENSI PENCEGAHAN DAN PENGURANGAN KEMUDARATAN ALKOHOL* {Guidelines for alcohol screening and interventions}. Unit Alkohol dan Substans, Sektor MeSVIPP, Bahagian Kawalan Penyakit (NCD).

Sampling

As described in the phase one of this study, the geographic mapping was carried out to identify six localities in five sites within the Klang Valley by utilizing data from the Population and Housing Census of Malaysia 2010. The selection is based on the categorizations of the urban/semi-urban area and density of respective ethnic groups. Areas with a population density of identified ethnic group below 5,000 are considered semi-urban, while the density of more than 5,000 was considered urban. The selected five 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 youth congregate and socialize with each other.

Multi-facet sampling was applied to identify respective youth. Initially, probability sampling is used to identify youth of required ethnic groups. Followed by, a convenient sampling which categorised youth 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 and Malay. Exclusion criteria were: i) refuse to give informed consent, and ii) severe medical problem preventing participation (*visible mental or physical health which may hinder participation is considered as exclusion criteria).*

The current obtained sample of 326 youths estimated the proportion of risk or drinking at the margin of error of 5.38% and a confidence interval of 95%. The current population prevalence of drinking was 32.5% and the overall response rate was 52.5%.

Measures

The dependent variable of interest in the current analysis is defined as a "pattern of alcohol consumption". The definition is described in the "Classification of Alcohol Consumption Patterns" section above.

The independent variables are identified as "family influence", "social influence", "ethnicity", age and "gender". Family influence on alcohol consumption is defined as having one or more immediate family members who consumed alcohol. Social influence on alcohol consumption is defined as having one or more friends who consumed alcohol. To reflect Malaysia's multi-ethnic background, "ethnicity" was grouped into three categories: Chinese, Indian and Malay's.

Statistical Analysis

Data were analysed using Statistical Package for Social Studies, version 22 (SPSS IBM, NY). Descriptive analyses were performed to calculate the mean age of male and female participants, as well as the frequency and percentage of ever-drinkers, current drinkers, and binge drinkers. Further analyses included Pearson's Chi-squared test of independence to identify factors that are significantly associated with patterns of alcohol consumption. Level of significance of all the tests is taken as *p-values* of less than *0.05* [two–tailed]. Significant variables are selected for further evaluation using multiple logistic regressions.

4.2.3 Phase three:

The use of alcohol and tobacco is usually prevalent among young users and this is evident over time (Falk, Yi, & Hiller-Sturmhofel, 2006);(Sher, Gotham, Erickson, & Wood, 1996);(Jackson, Sher, Cooper, & Wood, 2002);(Drobes, 2002);(Wray, Merrill, & Monti, 2014);(Gritz et al., 1998);(Myers & Kelly, 2006);(WHO, 2015). At times the prevalence of these substances is studied independently, and even then, the misuse of any substances is worrying. For instance, there is sufficient evidence on the harms associated to smoking over the last few decades (Sopori, 2002);(Huxley & Woodward, 2011) (Giovannucci, 2001) and tobacco use continues to escalate among the youths (WLF, 2015). The smoking prevalence among youth is perturbing since, those who use cigarettes, are now experimenting with or transitioning into different tobacco products such as electronic cigarettes/vape[10], shisha/hookah[11] (Health, 2017). Shisha/hookah is widely used in countries such as South East Asia (Sinha, Palipudi, Rolle, Asma, & Rinchen, 2011);(Singh et al., 2017). Thus, it is hard to ignore the association between tobacco use and alcohol co-dependence among young adults.

In this phase of the study, the researcher adapted the triangulation approach; that applies the between-methods type of triangulation with the emphasis on qualitative data that correlates with quantitative findings (Thurmond, 2001);(Carter, Bryant-Lukosius, DiCenso, Blythe, & Neville, 2014). The between-methods triangulation is based on combining quantitative data from ethnography findings, specific questions on other substance use from self-administered questionnaire and finally with the qualitative thematic findings that are derived from semi structured interviews.

[10] Electronic cigarettes, also known as e-cigarettes, e-vaporizers, or electronic nicotine delivery systems, are battery-operated devices that people use to inhale an aerosol, which typically contains nicotine (though not always), flavorings, and other chemicals. https://www.drugabuse.gov/publications/drugfacts/electronic-cigarettes-e-cigarettes

[11] Shisha smoking – also called hookah, narghile, waterpipe, or hubble bubble smoking – is a way of smoking tobacco, sometimes mixed with fruit or molasses sugar, through a bowl and hose or tube. https://www.bhf.org.uk/heart-health/risk-factors/smoking/shisha

Frist Data Source:

First data source derives from ethnographic field mapping from five areas, mentioned above; using Spradley's observational (Spradley, 1980) methodology which identified localities that sold items such as alcohol, cigarettes and shisha to respective ethnic groups of clientele that also caters to youth patronage. Details on study mapping are described in an ethnographic study that also reflects youth substance use patterns within Malaysian setting over the timeframe of 2014-2016 (Singh, Reidpath, & Allotey, 2017).

Second Data Source:

The second source of data is based on the quantitative study from the Youth Risk Behavior Survey [YRBS] that is completed by 326 youth from three ethnic groups in the identified areas. This study methodology framework is described above and published in 2017 (Singh, Kaen, et al., 2017). However, measure variables here differ from the earlier study. The dependent variable of interest in the current analysis was defined as "tobacco use". These variables are categorized into three patterns of ever-smoker, current smoker and a heavy smoker. "Ever-smoker" was defined as those who reported trying the cigarette at least once over their lifetime – not inclusive of current and heavy smokers. "Current smoker" was defined as those who smoke at least one cigarette in the past 30 days– not inclusive of heavy smokers. "Heavy smoker" was defined as those who smoke more than 20 cigarettes in the past 30 days. The independent variables are identified as "ethnicity", "age" and "gender". Malaysia's multi-ethnic background, termed as "ethnicity" was grouped into three categories: Chinese, Indian and Malay's.

Final Data Source:

The final data source was obtained from a semi-structured interview that explores respondent's feedback on initiation factors-; availability; perception of health risk caused by shisha; and youth's perception on suitable interventions that would help curb increasing trend of shisha use. A total of 78 youths was approached of whom 40 participated. The semi-structured interview technique, that used contextual inquiry[12] was adapted from Haltzblatt and Jones that emphasise the need for participatory engagement that is also later redefined by Schuler and colleagues (Schuler & Namioka, 2017). This method was adapted and applied by Iranian researchers – who explored similar issues among shisha users (Baheiraei et al., 2015). The average time allocated to complete the questionnaire and interview was 40 to 50 minutes. No repeat

[12] *Contextual Design* is a structured, well-defined user-centered design process that provides methods to collect data about users in the field, interpret and consolidate that data in a structured way.

interview was conducted. Interviews were recorded and transcribed in verbatim format. The qualitative data were coded by the research team, whereby coding is done by the primary investigators who also monitored the process of conducting/reporting semi-structured interview. Finally, qualitative findings are based on a thematic analysis.

Overview of data triangulation process on all three phases of this study is described below in Figure 9.

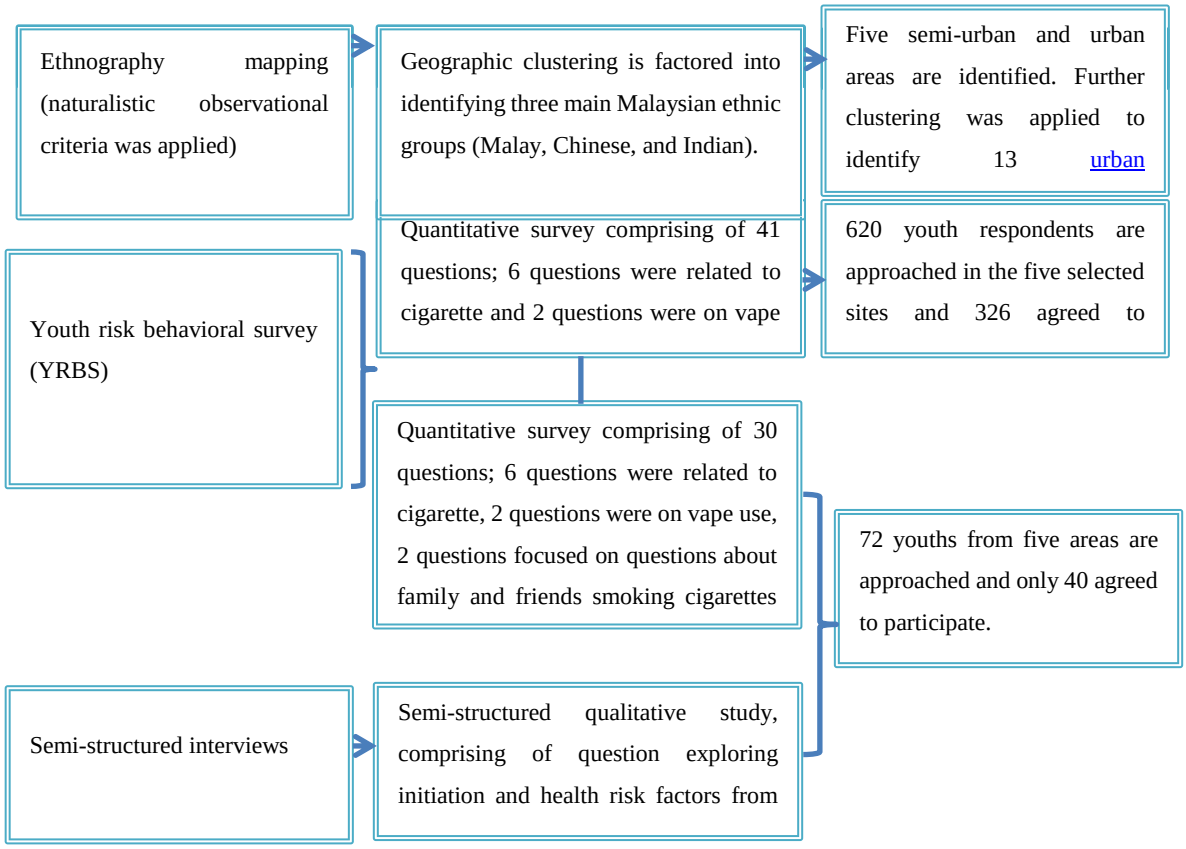


Figure 9: Description of the study sources and data for triangulation purposes

4.3 Ethics Approval

Ethical approval was obtained from the Perdana University Institutional Review Board (PUIRBHR0081 & PUIRBHR0083) and Monash University Human Research Ethics Committee (CF/14/3510-2014001851 & CF/16/762-2016000369) in Malaysia. Written consent is sought and granted from participants explicitly via consent forms before participating in the study.

CHAPTER FIVE: SOCIO-CULTURAL ENVIRONMENTAL FACTORS

This review is submitted as part of a manuscript has been accepted by the research committee of the *3rd UUM International, Qualitative Research Conference (QRC) 2018. The manuscript will be published in the proceeding (ISBN) and will be considered for publication in SCOPUS or INDEXES journal. The conference is held from 10 to 12th July 2018 in Melaka, Malaysia. There may be some coinciding information in the thesis chapter; this is to ensure that the chapter could stand alone as a published paper. Efforts will be made to minimize duplication; however, IMRD approach will still be applied here. In addition, the results section presented here is expanded to reflect the thesis framework described in chapter two.*

As described in chapter four, the findings from qualitative and quantitative methods are aimed at demonstrating the socio-environmental influences and its impact on youth alcohol use. Hence, ethnographic mapping finding is written in a manuscript format and it will emphasize the impact of accessibility and availability of alcohol use in five researched sites.

5.1 Introduction

Since 2009 the government of Malaysia believes that health consequences from alcohol use are of low priority as consumption is only reported within the Chinese and minority Indian ethnic groups (Wan et al., 2005);(Assuntha, 2001);(Jernigan & Indran, 1997). This belief is factored in Malaysia, as it is a predominantly Muslim nation with Islamic religion governed by "Sharia Law[13]"; which

13 Muslims in Malaysia are governed by Islamic personal and family law, which has been in existence since the 15th century. Islamic laws have been administered, not only by the Syari-ah Courts, but also the Civil Courts. "Syariah Laws In Malaysia". Herald Malaysia. Online Edition on 25th Feb 2017. http://www.heraldmalaysia.com/news/syariah-laws-in-malaysia/34923/14

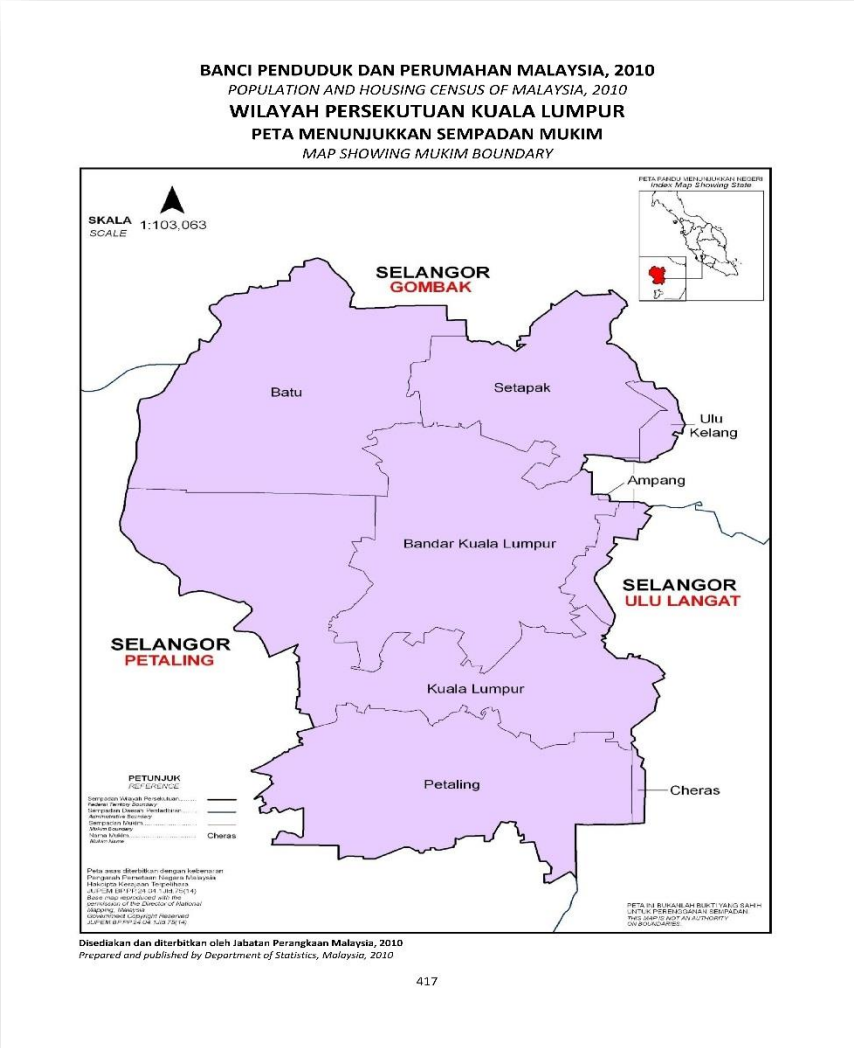
prohibits Muslims from consuming alcohol unless it is a matter of life and death or with the approval of a Muslim doctor (Mohd Ramlan Mohd et al., 2015);(Fadzli & Amer, 2014);(WHO, 2004);(Mutalip, Kamarudin, Manickam, Hamid, & Saari, 2014b). Abstinence levels of alcohol consumption amongst Muslims in Malaysia, stand at 81%, which denotes a national prevalence within the range of 2% to 5% (WHO, 2004);(Mutalip, Kamarudin, Manickam, Hamid, et al., 2014b). However, there is limited evidence that emphasized riskier consumption patterns is evident (Mohd et al., 2015);(Mutalip, Naidu, Kamaruddin, Hamid, et al., 2013);(Mutalip, Kamarudin, Manickam, Hamid, et al., 2014b);(Yahaya, 2000);(Maniam, 1994) within the local context. By 2011, local studies continued to quote "Malaysia ranked 10th highest alcohol consumption in the world" (Mohd et al., 2015);(Yahaya, 2000). By 2013, the Ministry of Health reported that approximately 7% of Malaysians aged 15-19 years old were labelled as current alcohol consumers (Mutalip, Naidu, Kamaruddin, Hamid, et al., 2013);(WHO, 2014) and riskier alcohol consumption patterns continued to ascend indicating binge drinking prevalence of 5.7% which doubled since 2006 (Mutalip, Naidu, Kamaruddin, Hamid, et al., 2013).

In addition, for those who binge on alcohol are predisposed to exhibit more negative behavioural risk factors (WHO, 2014);(Poikolainen, 2000), that were equally perturbing within the local context. For instance, a 2012 MIROS's report on a road-related fatality in Kuala Lumpur revealed that 23.3% drivers were under the influence of alcohol; this, the report was primarily driven to address systematic gaps in policies to deal with drunk driving laws within a local context (Lee, Chen, Lee, & Kaur, 2006). Currently, offenders are being charged under the Road Transport Act 1987; if found to have exceeded the limit of alcohol content in the body (Y. Cheah, 2014). A local study done on 1622 undergraduates students indicated that 7.2% have driven under the influence of alcohol and 19.3% were passengers in a car driven by a driver under the influence (Liew, Noor, Raymond, Nadzrah, & Moy, 2011). By 2011, the National Health Morbidity Survey indicated that people from the low economic background and low education level displayed heavier consumption patterns (Mutalip, Kamarudin, Manickam, Hamid, et al., 2014b). In addition, a local study among 4500 adolescents noted that riskier sexual practices were prominent among those who were alcohol consumers (Lee et al., 2006).

As per the evidence discussed above, local alcohol consumption patterns were prominent amongst certain ethnic groups and riskier consumption patterns were prevalent among youth. However, evidence discussed above has also alluded to the fact that, due to the sensitive nature of alcohol consumption specifically among the Malays and youths, it is at times difficult to ensure that the national level and school-based data reveals the actual consumption patterns (Y. Cheah, 2014); (Fadzli & Amer, 2014);(Liew et al., 2011);(Flynn & Wells, 2014). Riskier consumption patterns were also noted by a general practitioner back in 1994 (Maniam, 1994). Thus, emphasizing the need for community-based studies within Malaysian context where alcohol consumption patterns are socially sanctioned. These forms of sanctions may accentuate the need to consume it privately among those who face legal implication if caught consuming alcohol at localities where communities congregate. In summary, community-based studies may also address the benefits of abstinence versus a negative impact of riskier consumption which is a necessary approach to address social sanction issues in Malaysia (Maniam, 1994);(Room et al., 1984); (D. Moore, 1992); (LeCompte & Schensul, 2010).

As described in the evidence above; to reflect community findings it's essential to capture alcohol availability and accessibility within the research areas so that a representative approach is adapted to document alcohol use and its harms within communities that are being observed (Flynn & Wells, 2014); (Hallgren, 2012);(White & Hingson, 2013);(Maniam, 1994). Thus, to reflect community norms that are generally practised around alcohol consumption practices among the youth within geographical makeup in Klang Valley, Malaysia (*see Image 1, a map of Klang Valley*); the researcher adopted an ethnographic mapping approach. Such an approach is used to comprehend the behaviours of young adults from respective ethnic groups on how they consume alcohol within their own residential areas (LeCompte & Schensul, 2010);(D. Moore, 1992). This form of knowledge on alcohol use or misuse in community settings is sorely needed, not only to monitor the magnitude and trends of alcohol use and its related harms; but, also to strengthen advocacy and help in the design and application of

Image 1: Map of Klang Valley, Malaysia



evidence-based interventions (Griffin, 2007);(Douglas, 2003). Therefore, the objective of this study is to carry out an ethnographic mapping that plots out geographical relationships of alcohol accessibility and availability within community settings.

5.2 Methodology

Ethnographic mapping:

Ethnography is both a research method and a product, typically a qualitative approach that is based on direct observation (Silverman, 2013);(LeCompte & Schensul, 2010). It emphasizes the importance of studying *first-hand* what people do and say in particular contexts. The purpose of applying ethnographic research is centred on two goals: (i) understanding the social and cultural problems in communities/institutions- since sensitive social and cultural norms do apply to all ethnic groups in a Malaysian context (Mohmamed et al., 2008);(Steinka-Fry, Tanner-Smith, Dakof, & Henderson, 2017);(LeCompte & Schensul, 2010) and (ii) using the research to develop and assess approaches to solving problems or bringing about positive change in institutions and communities (Flynn & Wells, 2014).

Mapping:

The initial step was to review the 2010 National Population and Housing Survey (NPHS) data. The NPHS in 2010 was based on a population density of 86 persons per square kilometre (DOSM, 2010).

The study is based in the large conurbation within Malaysian city of Klang Valley area; which is a larger segment of the area surrounding Kuala Lumpur, that is covered by ten municipalities which are also densely populated with 7.2 million people (Kushairi, 2017). These form of densified municipalities areas are surrounded by communal and recreational facilities in central commercial blocks. These commercial blocks serve to bring people together in shared activities (State, n.d.). For this study's purpose; the communal areas with low-density of a certain ethnic group that ranged within 1,000-5,000 will be considered as semi-urban site and high-density areas that are above 5,000 are identified as urban areas. Based on this characterization, the researcher classified the study sites as listed, in Table 14.

Table 14: Classification of identifies sites

Site	Population size (based on 2010 census)	Ethnic Groups	Classification
Setapak	159,610	Malay	Urban
Cheras	3, 101	Malay	Semi-Urban
	4,910	Chinese	Semi Urban
Petaling Jaya	147,934	Chinese	Urban
Batu	33,643	Indian	Urban
Ampang	3,372	Indian	Semi-Urban

Adapted from: Department of Statistics Malaysia. Total population by ethnic group, mukim and state, Malaysia, 2010. Available from: URL:http://www.statistics.gov.my/portal/download_Population/files/population/05Jadual_Mukim_negeri/Mukim_WPKL.pdf

Identification of research sites:

Once the identification of semi-urban and urban areas of a certain ethnic group is classified; the researcher applied a second selection criterion that identifies higher education institutions within a five kilometres radius of the selected communal areas. This is a necessary criterion, because youth may select living in spaces that were within close proximity to their educational or work sites (Leh et al., 2016). Based on the academic institution mapping; the third criterion was applied to identify a minimum of three commercial blocks within the selected communal areas. The selection of three commercial blocks with sample size estimates on youths is described in Appendix 2.

The researcher was cautious not to expand these selection sites to areas where the population density may include high migrated or expatriated population such as Bangsar, Damansara, Mont Kiara or even selected areas in Petaling Jaya which also fall within Klang Valley boundaries. This was done as such areas may have more food and beverage outlets that serve alcohol to cater to its residential foreign market.

Once the commercial blocks are identified, the researcher mapped out food and beverage locations that were frequented by youths. The identification of respective locations is borrowed from Spradley in 1980. He described observations that help to explore/identify the spaces and environment or structures that support the use/misuse of alcohol and other risk behaviours in areas where youth congregate (Leh et al., 2016);(Gruenewald, 2007);(Spradley, 1980). Spradley's observational method was useful since it specifically addresses the structural elements that are reflective of consumption behaviours and provided a quick overview of how to quantify the accessibility and availability of alcohol within these sites. Even though the temporal relationship between accessibility and availability that impacts youth consumption patterns may be tough to determine; this process was helpful to observe consumption behaviours within respective communities. As described by LeCompte and Schensul the validity of ethnographic research can be difficult but various measures and triangulation efforts have been taken into consideration to avoid bias in reporting (LeCompte & Schensul, 2010).

Each commercial block was assigned with a unique identification code as described in Table 15 below. This process was essential to ensure anonymity in the data collection processes. It is important to note here; that the datasheet on several localities that sell/serve alcohol cannot be shared with any third party other than the research team. The datasheet comprises information on the communal areas, commercial blocks and street address that identifies each producer/seller/supplier of alcohol in respective research sites. Due to social sanctions on alcohol use by a certain ethnic group in this country, this type of information is sensitive and protection of privacy of these localities is merited. If required, data sharing can be considered if the terms of a data sharing agreement adhere and if the rights and privacy of the provider/sellers/suppliers are protected.

Table 15: Sites classification, identification codes and populations size

Site	Unique ID & description on population size (for selected sites)	Description of selected urban/semi agglomerations area
Setapak (urban Malays)	STP:M/UR/01/001: Approximately 152,505 Malay residing in Setapak. 17% of youth (age 15-29) Est = 25,925. Within each age range 25,925/14= 1,825. 18-25 are Est at 14,816. 10 metropolitan sites identified {14,816/10= 1,482 youths at respective metro sites}. 3 metro sites were selected, hence sample size for Malay youth 4,446	{area of 62 square miles (160 km2)} In the middle of Setapak is the township of Wangsa Maju [source: NPHS data]. Assessed on 15.10.14].
Petaling Jaya (urban Chinese)	PSS: C/UR/02/001: Approximately 160,652 Chinese and estimated no of youth (age 15-29) 17% (27,311 youth): with the age of 15-95 =27311/14=1,951 youth. {1951/85= 23 youths at respective metro sites}. 23x3 = sample size of 69 youth	{97.2 square kilometres (37.5 sq mi)}. Central Business District of Petaling Jaya with the landmark Menara MBPJ as a focal point [source: NPHS data].
Batu (urban Indian)	BKL:I/UR/03/001: Approximately 48,175 Indian and estimated no of youth(age 15-29) 17% (8,190). 8190/14 of youth age 15-29=585 youth in each age range. 18-25 =585x8=4,680 youth within the age range of 18-25. {4680/28= 167 youths at respective sites}. At 3 metro sites, there were 167x3= 501 sample size of the youth	Batu constituency includes Sentul. Sentul Raya is a new township located in the proximity of Sentul in Kuala Lumpur, Malaysia. Bandar Baru Sentul is located next to Sentul Raya [source: NPHS data]. Mapping of area-km actual will be done onsite.
Cheras (semi-urban Malays)	CSL:M/SUR/011/001: Approximately 1,219 (semi urban.5000) Malay residents in Cheras. 17% youth (age 15-29) Est = 207. Within each age range 207/14= 15. Hence, 18-25 are Est = 120 youth at @ Metropolitan sites {120/12= 10 youths at respective sites}. 3 metro sites we selected 3x10= 30 Malay youth sample size	Pusat Komuniti Bandar Tun Razak which is located at Taman Mulia [source: NPHS data]. Mapping of area-km actual will be done onsite.

Site	Unique ID & description on population size (for selected sites)	Description of selected urban/semi agglomerations area
Cheras (semi-urban Chinese)	CSL: C/SUR/022/001: Approximately 4,910 Chinese (< among all others because the semi-urban site is below 5,000 markers) and estimated no of youth (age 15-29) 4,949 all ethnicities. 17% youth age 15-29 =835/14=60. Hence, 18-25 age youth are 60x8=480 per site. 480/12 metropolitan sites= 40 youths at 3 respective metro sites= 120 Chinese youth sample size	Bandar Tun Razak. [source: NPHS data]. Mapping of area-km actual will be done onsite.
Ampang (semi-urban Indian)	ASL:I/SUR/033/001: Approximately 3482 Indian & estimated 17% of youth (age 15-29) = 592/14= 42. 42 youth from 18-25yrs old 42x8=336 {328/10 metro sites= 34 youths at respective sites}. 3 metro sites = 34x3 = this site sample size of youth is 102 youth	Pandan Jaya and Pandan Indah. [source: NPHS data]. Mapping of area-km actual will be done onsite.

Once the localities were identified; Cohen's store observational tool was used to document localities placement of alcohol and promotional adverts of alcoholic beverages in outlets within respective research sites (Cohen et al., 2007). The applicability of this tool in the US and its reliability findings was taken into consideration before it's applied in local context. Some adjustment and simplification were necessary in order to ensure that local localities representatives were not intimidated when such a tool was administrated. The adapted tool reflected some of the key criterion listed in Table 16. There was a need to apply some form of diplomacy when this tool was administered at respective localities. An overview of the study, with detailed information of anonymity process, was assured to vicinity representatives because some of these representatives believed that they might face legal implication if such information was shared with others. Thus, verbal consent was obtained from the vicinity owner or manager before the tool is administered. This consent process was beneficial for the researcher. An unexpected outcome resulted in voluntary sharing session by vicinity owners, managers and staff that provided information on selling process, buyers profile and their observation on youth consumption patterns within the communities they operated.

Other than the spatial dimension, observation and interactions that took place when the store observation tool was administered; it was evident that there is also a need to capture youth's perspective on alcohol use within their neighbourhood. Such information was necessary since youths were observed loitering around off-premises retail outlets or even supermarkets in which alcohol is sold.

The site identification and application of store observational tool reflected cyclic iterative process, which is used in ethnographic mapping. This process encapsulates the observation, interactions and quantitative data on youth's day to day behavioural patterns around alcohol use and how this impacted youth's ecology (Whitehead, 2005). Also, the cyclic iterative process was used to avoid self-bias in understanding or interpreting the findings. The next step in ensuring a cyclic iterative process was to capture youth's perspective on alcohol use within their neighbourhood.

Table 16: Observational Instrument (Identification of alcohol service sites or service providers)

Category	Includes	Researcher note
Mapping of service providers or sellers	Stores who sell alcohol- including food & beverage outlets where youth hangout	Observation would include: type of outlet; the extent of alcohol advertising inside or outside of the outlet; purchase price; placement and availability (timing of the stores or visible signs that indicates that sale is not permitted to anyone below 21 years)- Geo code sites
Verbal behaviour and interactions	Who speaks to whom and for how long, who initiates interactions, language or dialects spoken, the tone of voice around alcohol	Gender, age, ethnicity and groups of which youth interacts – dynamics of interaction
Hang out joints	Approximately how many youths hang out, what time are more youth visible, how long do they stay in a certain locality and how could they be approached	Type of groups identified, preference or their association with alcohol availability and drinking patterns- also apply to geocode (geographic coordinates)

Source: A combination of Reliability of a Store Observation Tool in Measuring Availability of alcohol and selected foods: (a) Point of purchase alcohol marketing and promotion by store type-US, 2000-2001. MMWR Morb Mortal Wkly Rep and (b) Qualitative research method: A data collector's field guide from Family Health International.

Self-Administered Questionnaires on Opinions and Drunkenness among youth who consume alcohol:

As highlighted earlier, the application of store observational tool was challenging. One of the challenges was to assure anonymity of the information gathered. Thus, a non-confrontational approach was required to approach youth to provide their perspective on alcohol use within these sites. Keeping this in mind, I applied an adapted version of opinions and drunkenness self-administered survey; that was developed by Health Promotion Agency, in Wellington, New Zealand in 2013 (Health Promotion Agency, 2013). This tool was adapted to ensure a non-confrontational approach is applied to probe the opinions and behaviours of youth around alcohol use. This form of approach is necessary; as described by Seddon and Ahmed in their book on "Muslim youth; challenges opportunities and expectation", it is important to ensure that the majority youth in Malaysia are not impeded by the Muslim integrity and religious fidelity (Seddon & Ahmad, 2012). Therefore, this questionnaire which comprises of twenty questions; explored demographic characteristics, intrapersonal, interpersonal and environmental factors around alcohol use. At an individual level, questions are directed at exploring perception and awareness of alcohol use within their residential areas. As for the interpersonal explorations; questions explored the issues around family and peer's knowledge or norms around alcohol use. As for the environmental factors; questions were posed to assess youth awareness of legal implications and accessibility factors around alcohol use. The self-administered survey was distributed to youths at respective sites (*target to reach 25 males and 25 females from each of the six areas*). Due to the multi-ethnic origins of participants, the questionnaire was written in English and translated into Bahasa Malaysia[14]. Most of the Malaysian youth have obtained academic qualifications from public schools; hence, they can understand and read both these languages. However, participants were provided with options whether they would like to respond in English or Bahasa Malaysia questionnaire. The consistency of the questions in dual language was checked by native Malay speaking academic members; who also ensured that the forward and back translation were tested. Pilot testing of the tool was carried out to ensure the reliability and consistency of the adapted version. The pilot testing comprises of the face (Bolarinwa, 2015) and content (Kelley et al., 2003) validity. This self-administered survey is available in Appendix 4. Based on the ethnographic mapping activity described above; youths from respective ethnic groups were approached at urban/semi-commercial blocks. Informed consent was obtained before the self-administered questionnaire was administered. Probability (*ethnic representation,*

[14] The official language of Malaysia.

youth within the age range of 18-25-year-old, residing within the residential areas) and convenience (*once selection criteria were met, youth interest in participation is explored*) sampling method was applied. At each site, I aimed at recruiting 100 (*100 = 50 male and 50 females x 6 sites = 600*) youth. Hence, a total of 600 youths were approached, and the final number of youth who completed the questionnaire was 207. A response rate of 34% is attained. A complete overview of the methodology applied in phase one is illustrated in Figure 10.

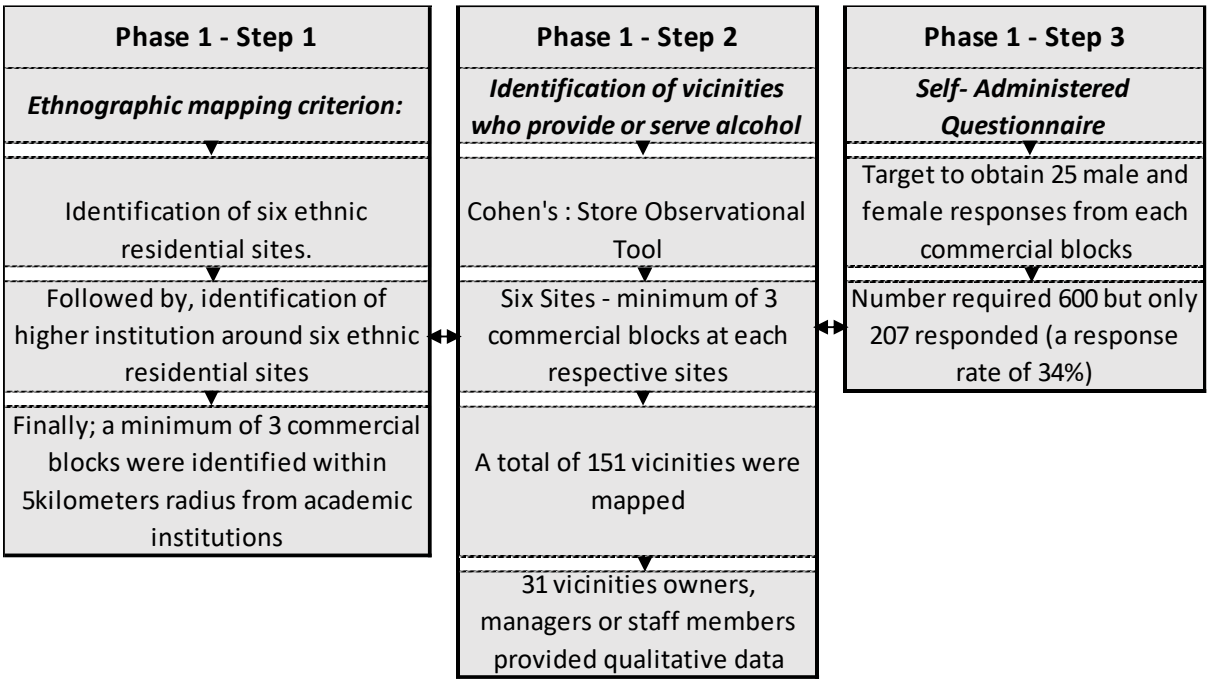


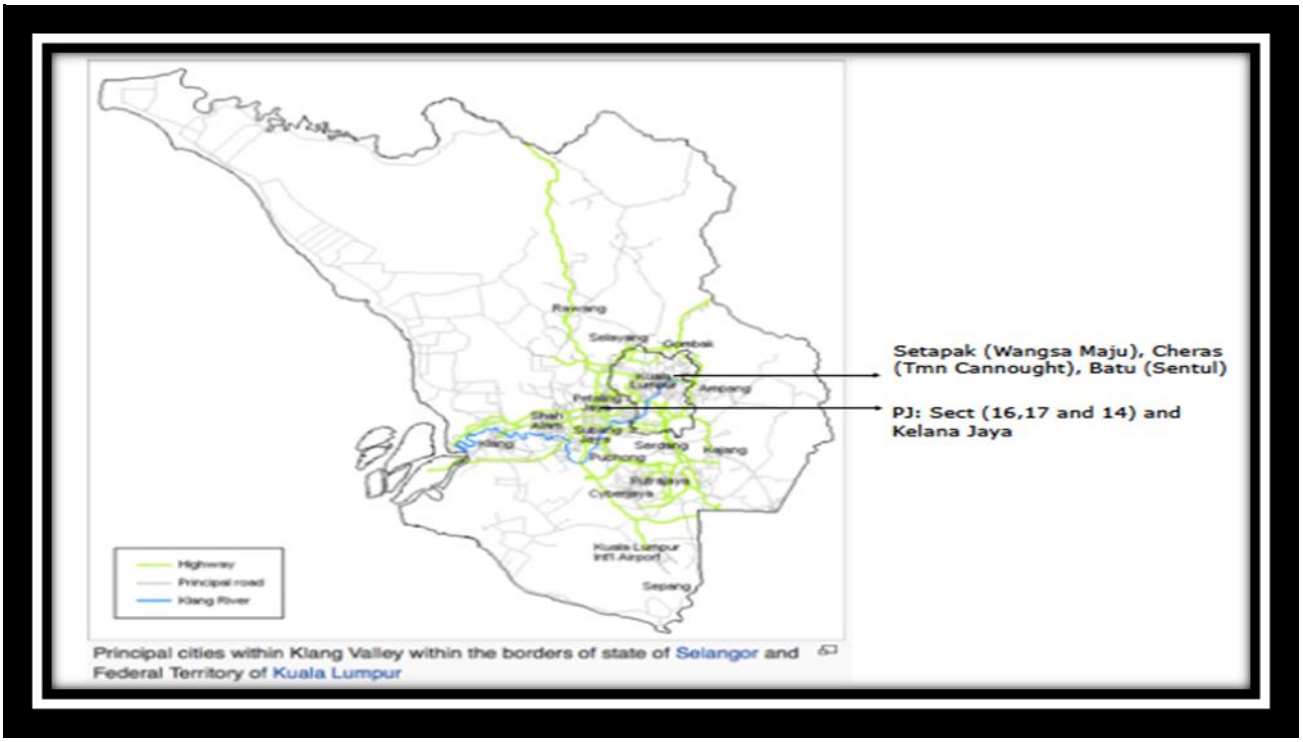
Figure 10: Mechanism, activities and tools used in ethnographic mapping

5.3 Results

Observational findings:

The observation was done over a two-year period from 2014 to 2015 at different times during weekdays and weekends. The observations were also conducted during festival seasons, school and institutional holidays as well as other public holidays. Image 2 on the right shows the map of Klang Valley, Malaysia and with labels on identified sites.

Image 3: Klang Valley Map in Malaysia and identified research sites



Identification of urban/semi agglomerations:

Once the sites were identified google maps were used to identify urban sites as shown (Image 3) when search classification is applied; on the right indicates a google earth snap short of Petaling Jaya urban/semi agglomerations area, taken on 6th July 2015. Similar images were taken for all sites. The researcher ensured that rigorous monitoring of urban/semi agglomerations sites was done via google earth as shown in Images 3 and 4 snapshots that were taken in Petaling Jaya on 6th June 2015 & Setapak area, on 7th July 2015 respectively. Images were also taken of alcohol sales in various outlets within these areas [Image 5].

Image 4: Petaling urban agglomerations mapping on 6h June 2015

Based on the data collected through observation fieldwork and through the application of the observation tool, the researcher identified 151 Service Providers (SP) or outlets (Os) that sold alcohol at their premises. The numbers of SP/Os in each respective area are as follows: 3 identified areas with 59 SP/Os in Cheras, 3 areas with 32 SP/Os in Batu, 3 areas with 28 SP/Os in Petaling Jaya, 3 areas with 26 SP/Os in Setapak and 1 area with 6 SP/Os in Ampang Only one area was identified in Ampang as it has just one specific area that was populated by an Indian ethnic group. The rest of the urban/semi agglomerations [i.e.: identified] areas in Ampang were primarily populated with foreigners or Malay ethnic groups. Due to the sensitive nature of alcohol sales and legislation in this country, the data sheet on sites identified with timing and listed addresses will not be shared here. Generally, there were more alcohol SP/Os in Chinese populated areas (Cheras+Petaling Jaya N=77 between N=9-15 providers in an urban/semi-commercial block), compared to Indians (Ampang+Batu N=38 between 5-20 providers in a certain urban/semi agglomeration block) and for

Image 6: Setapak area mapping on 7th July 2015

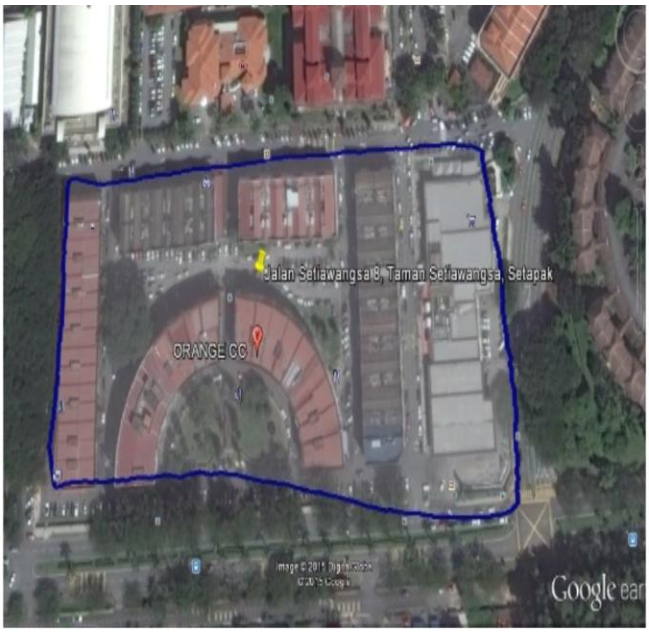


Image 5: Aeon Supermarket in Sentul, display on 14th Feb 2016

Malays (Cheras+Setapak N=36 between 0-22 providers in a certain urban/semi-metropolitan block). Average operating hours of these SP/Os is approximate 15hours a day. Basically, 33% of youth frequented and consumed alcohol at these localities. Majority of youths who were observed consuming alcohol were Chinese and Indians. It is important to note that 85% of the SP/Os were able to sell or serve alcohol from 10 am to 10 pm. The density of the SP/Os in respective areas was within the 0.9-10.9/100m radius in Chinese populated sites, followed by a 0-4.2/100m radius in Malay populated areas and finally 0.-5.97/100m radius within Indian populated areas (the distance is subjected to extrapolation, providing an indication of the maximum number of SP/Os observed in each area).

Characteristics of service outlets;

SP/Os were mainly located at normal shop lots (49%) in the main urban/semi agglomerations areas. The majority (40%) were in the form of convenience stores (7-Eleven, 99 Speedmart and KK Mart), followed by supermarkets (approximately 36% of the supermarkets were Aeon, Giant or Tesco). Only 33% of stores operated for 24 hours. Most of the stores stopped service or sale by 10 pm. In supermarkets, beers are placed separately outside the wine and liquor section. It is an easily available item to purchase and is even available to consumers after the liquor section closes at 9 pm, prolonging the hours of sales. Liquor Stores are usually managed by Chinese or Indians. All types of alcohol beverages were available without any visible restriction notes. Online information on 7/11 (a 24-hour convenience store) retailers confirms that the "General Manager" is of Malay ethnic group and most (70%) of the attendants at respective stores are also Malays. There were restriction notes against selling alcohol to anyone less than 18 years of age and Malay consumption violation in relation to religious laws in all 7/11 outlets. Based on communication with store employees, there is a high turnover of staffing within 7/11 stores. Based on the voluntary information offered by an employee, he claims that ethnic client profiling is difficult to ascertain visually. However, when a number of 7/11 employee gathered to speak to the researcher, they claimed that Chinese and Indian youth groups will purchase large quantities of alcohol during weekends. The employees also shared that the older Malay men were noted to purchase quite randomly at different times of the week. The other two commonly observed convenience stores are KK Mart and Speedy Mart, which are both managed by Chinese owned corporate companies. There was a much wider selection of alcohol available in these two outlets compared to 7/11.

Display of alcohol beverages and advertisements:

Most (75%) of the stores, displayed alcohol in refrigerator/cooler; whereby some (55%) would also display alcohol bottles on shelves. The percentages do not sum up to 100% due to the observational method deployed. As observed in Image 6, marketing advertisements were widely visible in areas populated by Chinese (average of five ads per outlet) and some were noted in multi-ethnic areas such as Cheras (average of 3.67 ads per outlets). Advertisements were most commonly seen in Chinese food courts, cafés and liquor stores, but were rarely found in supermarkets, chain stores and convenience stores.

Type of alcohol:

Beer (94%) and liquor (58%) were more commonly sold compared to other alcoholic drinks, with wine more popular among the younger age groups (20-30 years of age). The percentages do not sum up to 100% due to the observational method deployed. It was physically difficult to provide numeric data on items displayed. Each site may be selling more than one type of alcohol. Beer was relatively cheaper (RM3 to RM20- ranging from 300ml bottles to 1litre bottles, which is equivalent to USD1-USD5) and based on observation it is the most widely accessible alcoholic drink and is preferred by all ethnic groups.

Image 7: Advertisement on Chinese restaurant wall, located in Cheras

Alcohol purchasing pattern:

Informal interactions with SP/Os representatives indicate that most of the clientele are above 20 years of age. However, upon further exploration, none were able to clarify how guesstimates of age were made since no identification was requested. Regardless, supermarkets and convenience stores have signage on shelves which indicate that a sale of alcohol is prohibited to those less than 18 years of age and Muslims.

Field Notes:

As indicated above, the SP/Os representatives were vigilant of the researcher's presence since the researcher frequented these sites over two years which comprised of 15-25 visits at each respective area. Similar reservations and concerns were also observed among the community members and enforcement officers, who were also patrons of these areas. Once the community members were provided with an overview of the study, they were ever so willing to share their opinions on the subject matter. However, they were equally cautious and requested anonymity from the researcher. Such concerns were voiced so that social sections on alcohol use are abided within the community. Thus, assurance was provided that information such as the nature of locality, licensing issues or identifiable facts on community members will not be shared with local enforcement authorities.

The SP/Os interacted by sharing information on how the local youth consumed alcohol and behaved after consumption within their respective premises. Approximately 31 SP/Os offered information that supported findings in this study. Some (N=7) alcohol SP/Os revealed that there were older and younger Malay groups who were seen buying alcohol occasionally. However, this form of information was only shared in areas where Malay residents were the minority ethnic group. The information also revealed that most Malay respondents preferred to consume in private due to religious prohibitions and because of the social sanctions they are subject to. A local street vendor, who was situated in the middle of a pathway that separated Indians and Malay residential blocks, shared the fact that most of Malays do not consume alcohol but for those who do consume, they do it in hidden spaces such as dark alleyways or behind shop lots. She also revealed that Malay youth would probably consume in parks because it is their usual hangout spot during the night. However, she also mentioned seeing unhealthy consumption patterns amongst the Indian ethnic group, witnessing them consume very heavily. She continued to share an incident that occurred a day earlier; she revealed that she saw a corpse of an Indian man on the side of the road and she believes that it was primarily due to alcohol overdose. She continued to stress that the social sanctions on alcohol use within the Malays promote abstinence, thus harmful consumption patterns are not visible in Malay community settings.

Most of the informal communication and observation revealed that beer was the preferred type of alcohol, followed by liquor, cider beer and wine. Based on observations and informal interactions, Chinese consumers were mostly consuming alcohol in food stalls and restaurants. While Indians, however, were noted gulping down alcohol from bottles directly after purchase and Malay consumers were observed

purchasing alcoholic beverages and consuming them at the back of shops or take them away to avoid being seen.

Most (80%) of SP/Os representatives claimed that the Chinese and Indians were the majority of alcohol consumers. The SP/Os representatives are aware that Malays are expected to refrain from buying alcohol due to religious reasons; however, some SP/Os representatives revealed that there were Malays seen purchasing alcohol through their Non-Malay friends (this was also observed especially during weekends around urban/semi agglomerations sites that had nightclubs close by).

Through shopkeepers, SP/Os information and observation noted that alcohol sales increased after 5 pm in certain areas or after 10 pm in most areas. Majority of Chinese youth or even older groups tend to purchase alcohol in bulk during festive seasons and special occasions. Indians were known to purchase alcohol in small quantities; however, this does not reflect patterns of alcohol consumption.

Self-Administered Questionnaires on Opinions and Drunkenness among youth who consume alcohol:

As mentioned above, out of the 600 youths approached, only 207 responded to the questionnaire. Individuals who refused participation, did so because of the sensitive nature of the research title or simply because they did not want to. The ethnic group representations of the 207 participants are 73 Malays, 79 Chinese, and 55 Indians. The 20 questions in a self-administered questionnaire were mainly designed in a manner that the youth didn't feel intimidated to answer. It was based on local knowledge of alcohol use, youth behaviours, perceptions and opinions about alcohol use within their residential areas.

Opinions:

Alcohol consumption was identified as a social ill by 64% of respondents who were aware of Malaysia being a tenth largest consumer of alcohol consumption globally. While the majority (58%) deemed it as one of many social problems Malaysia is confronting, 31% of respondents believed it is the most serious social problem that requires attention.

Although 59% of respondents agreed that alcohol consumption increases with accessibility, only 41% perceived that there is insufficient enforcement of alcohol misuse in Malaysia. However, respondents within each ethnic group perceived enforcement measures differently. For instance, 52% of Malays and 54% of Chinese agreed that there are limited enforcement measures on alcohol use within a local context, while 53% of Indians believed otherwise.

Most (68%) of the respondents, agreed that youths are consuming alcohol within their community settings/areas. Thus, the majority (77%) believed that it's important to educate children on risks associated with alcohol consumption. 42% indicated that alcohol consumption is influenced by a parent who consumes alcohol.

There were 12% of respondents who believed in total abstinence from alcohol consumption. Respondents who considered alcohol consumption acceptable indicated that those with a mean age of 16 years of age, should consume under adult supervision; whereas, those above 18 years of age, may consume without adult supervision.

In terms of gender, the majority believed safe alcohol consumption for both men and women is between 1-2 glasses (55% and 45% respectively). Twenty-eight percent agreed that 2-4 glasses of alcohol is safe for men. Only 2% believed that no one should consume alcohol.

Some (21%) of the youth indicated that it's acceptable to consume at home, whereby most of the youth (65%) agreed that dance/nightclubs or family/relatives' homes are suitable places to consume alcohol. Out of 102 respondents who answered alcohol consumption should be at home, 57% were Chinese. Whereas 27% of Malays and 31% of Indians agreed that the pub/bar is an acceptable venue for alcohol consumption. Figure 11 below shows the respective ethnic group of youths who selected options on a suitable venue for alcohol consumption. However, this variable was based on multiple selection options, thus the percentage would not round up to a hundred percent.

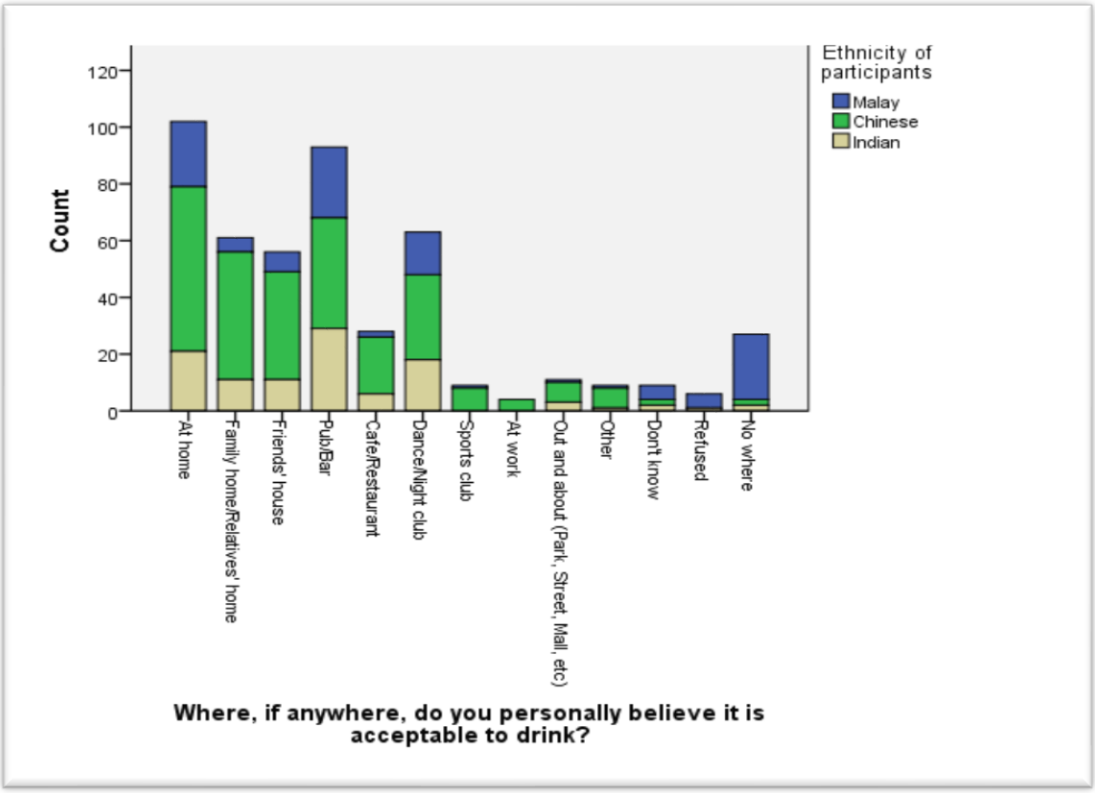


Figure 11: Percentage of preferred venue for alcohol consumption

Drunkenness:

Many (72%) responders agreed that alcohol consumption leads to risky behaviour. A total of 57% of respondents disagreed with the statement "It's ok to get drunk, as long as it's not every day". Almost half (50%) were against the fact, that drunkenness is accepted in any situation.

About half of the respondents (54%) had heard of or communicated harms associated with unhealthy alcohol consumption with others. Most (62%) of the respondents were approached by family or friends on issues pertaining to risks associated with alcohol consumption. A large portion (67%) acknowledged the importance of talking to friends whose harmful alcohol consumption patterns were observed. The three ethnic groups had different opinions on how often risky alcohol consumption patterns amongst family and friends should be discussed/addressed. For instance, nine out of ten Malay youths agreed that it should be addressed by family and friends. Fifty-eight percent of the Chinese and Indian youth (6 out of 10) believed that there were benefits of discussing and sharing such information on harmful alcohol consumption

patterns between family members or friends. Despite this, only 38% of the youth believed their family and friends would heed any advice on reducing the amount of alcohol consumption.

5.4 Discussion

Findings from this study indicate that restricted access and social sanctions on consumption of alcohol is only noted in areas with a large Muslim population. Whereas, there are limited restrictions noted in areas resided by Chinese and Indians. Thus, alcohol accessibility is a major concern, since the number of vicinities selling or serving alcohol in areas researched ranged within 6-50 providers within a 500-meter radius. In Malaysia, there is a clear guide on a licensing system for sales of alcohol; however, local Institute of Alcohol Studies has pointed out that these licensing boards rarely turn down applications, thus explaining the surplus of alcohol availability (Assuntha, 2001);(IAS, 2001). In addition, local industrial bulletin estimated that there are about 35,000 licensed outlets nation-wide. Findings from this study concur to the fact that was also reflected in Kortteinen's study; that Chinese and Indian ethnic groups may be part of the suppliers, producers, servers and consumers (Assuntha, 2001);(Kortteinen, 2008);(IAS, 2001).

These forms of accessibility and availability issues within the local context are not only detrimental to youths who reside in the studied areas but also impact their families and peers. As evidence from chapter three has indicated, parental monitoring and effective engagement are all relevant indicators in addressing risky consumption patterns. Similarly, alcohol use amongst the peers of youths is also known to be a major predictor of youth's own alcohol use.

At an individual level; the lack of knowledge on the risk associated with alcohol consumption is limited to none among the youth. Similar concerns are also noted by SP/Os and community members in this study. This was also reported by Arshad et al and currently, the local authorities are also enforcing stringent guidelines on tackling such matters in certain communities in Malaysia (Mohd et al., 2015);(Bavani & Lim, 2015). Improving knowledge is certainly needed since most of the youth in this study believe it's crucial to communicate on riskier alcohol consumption patterns with their family and friends. Similarly, other health risk and substance use studies within the local context have also emphasized the need for an evidence based preventions program that addresses the knowledge gap of youth on certain associated risk factors (Fauziah, Mohamad, Chong, & Manaf, 2012);(Al-Naggar, Bobryshev, & Mohd Noor, 2013).

5.5 Recommendations

- The findings from this study, have shown accessibility to alcohol within community settings is a concerning aspect. Thus, as global evidence has suggested, an increase in alcohol taxes [which exalt alcohol price] would impact accessibility and impact lower riskier consumption among the youth (Xu & Chaloupka, 2011);(UK Home Office, 2011);(Skolnik, 2015);(Toumbourou et al., 2007).

- In addition, evidence has also suggested that government-linked alcohol-related health services should be offered to the public as a way of reducing riskier alcohol consumption related to negative health outcomes. This would also address the barriers to access healthcare or counselling services which may be dominantly due to the fact of social sanction, stigma and discrimination associated with alcohol-related comorbidities (WHO, 2010b).

- The awareness and knowledge on riskier alcohol consumption among youths should be made available to the general population via alternative forms of mass media such as radio, television ads, magazines and even social network to ensure such information is existent and available to all (Seaman & Theresa, 2010);(Toumbourou et al., 2007).

- In addition, targeted intervention for youth should also be developed. Risk factors associated with unhealthy alcohol consumption patterns need to be addressed through a customized approach specific to each ethnic group (Toumbourou et al., 2007);(Conrod, Castellanos, & Mackie, 2008).

5.6 Limitation

Off-premise alcohol sales[15] were mainly focused on the mapping component. Bearing the concern of traffic congestion at peak hour and personal safety, selling a pattern of on-premise alcohol outlets e.g. pubs and bars could not be accurately captured due to them only being open at night. As mapping was done before 12 am, the study is not reflective of consumption patterns that occur after midnight.

Alcohol consumption is a highly sensitive issue in Malaysia, making a random sampling of participants difficult. The specified time frame of the survey (10am-11pm), selection of survey site based on the availability of respondents and the presence of alcohol outlets, are all limitations which result in the sample being less representative of the true population, especially in regard to Indian residents. In addition, the response is poor among Indians as there may be a language barrier or lack or rapport with the youths.

5.7 Acknowledgements

The researcher would like to extend gratitude to colleagues and volunteers who helped in approaching and recruiting some of the youths at the above-mentioned sites. Appreciation is extended to Lee Voon Kaen, Low Weng Hei, Alexander Tan Zhi Sheng, Liew Min, Lee Jia Mei and Anne Jamaludin.

5.8 Disclaimers:

These study findings are author's statement; hence views expressed in this manuscript and is not an official position of any institution or funder.

[15] Off-premise retail sale refers to the selling of alcoholic beverages for consumption elsewhere and not on the site of sale. Off-premise sale takes place, for example, in state monopoly stores, wine shops, supermarkets, and petrol stations or kiosks, depending on the regulations of the country. On-premise retail sale refers to the selling of alcoholic beverages for consumption at the site of the sale, generally in pubs, bars, cafes or restaurants.

5.9 Ethical approval

This study has obtained ethical approval from Perdana University, Institute Review Board (Ref: PUIRBHR0098) and Monash University Human Research Ethics Committee (MUHREC)-(Ref: CF16/762 – 2016000369).

In conclusion, the explorations of ecological factors which were initiated by addressing socio-cultural environmental factors need to be extended to include the normative influences of family and peer consumption practices among youths who are also residents of the studied areas.

CHAPTER SIX: INTERPERSONAL FACTORS

6.1 Background

This section of the study is published as a manuscript and abstract of the study is now available via online. The complete manuscript is in print with International Journal of Adolescent Medicine and Health; Ref No IJAMH-.2017.0062.

Following up on chapter five, the finding concludes the fact socioenvironmental influence are major determinants of youth alcohol use within certain researched areas. Therefore, it is essential to also address how such accessibility and availability impact youth who are also exposed to the normative influence of alcohol use within their household or among their peers. This chapter adapts the IMRD format to address ecological perspectives on normative influences and its impact on youth within the researched areas.

Ecological perspectives on youth alcohol consumption in the Kuala Lumpur conurbation: a place-based study in Malaysia.

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ABSTRACT

Objectives:

The objectives of this study are to investigate the patterns of alcohol consumption and ecological factors influencing those patterns in Klang Valley. The study focuses on youth from the Chinese, Indian and Malay ethnic groups in Malaysia, resident in urban and semi-urban settings of the Klang Valley.

Methods:

Data were collected with a combination of interviews and self-administered questionnaires available in Bahasa Malaysia and English was adapted from the CDC Youth Risk Behaviour Survey. Study sample consisting of 326 respondents: 103 Malays, 111 Chinese and 112 Indians. Male subject total up to 171 and females 155, with mean age of 20.56 and 20.59 respectively were identified by convenience sampling in 6 sites.

Results:

A combination of at least one family member and one friend who consumed alcohol was a significant driver of alcohol use: 80% in this category had tried alcohol; 55% were current drinkers; and 35% were binge drinking. With at least one family member, the respective figures were 72%, 48%, & 30%; and with at least one friend, but no family pattern of consumption, the figures dropped to 64%, 42% & 26%, respectively. With respect to ethnicity, 72% of Chinese youth had tried alcohol or were current drinkers (49%). The figure was lower for Indian youth (47% & 37%, respectively) and Malay youth (15% & 9%, respectively). In the binge drinking category, however, the highest figures were from the Indian youth (31%) followed by Chinese youth (23%) and significantly less in Malay youth (5%). Alcohol consumption was consistently higher among males: 54% had tried alcohol, 44% were current drinkers, and 30% were binge drinkers, compared to 36%, 18% and 9% of female youth respectively.

Conclusion:

Family alcohol consumption patterns were most strongly associated with consumption patterns which varied across the three ethnic groups. Family education regarding family influence on youth's alcohol consumption patterns is warranted.

Keywords:
Alcohol, Family, Ethnicity, Malaysia, Youth and Ecological Influences

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INTRODUCTION AND BACKGROUND

In 2010, globally, individuals above 15 years of age consumed on average 6.2 litres of pure alcohol per year, i.e 13.5 grams of pure alcohol per day. In 2011, harmful alcohol consumption resulted in approximately 2.25 million deaths globally - the top five risk factors for disease, disability and death throughout the world (1).

Evidence has indicated that risky alcohol consumption patterns among youth (18-26) are closely related to ecological factors that interact around the transitional times in their life cycle (2);(3);(4). In this context "ecology" usually refers to the study of individual within his or her environment. In 1979, Bronfenbrenner described the ecological concept as influences by parents and family on child development. In addition, to the broader societal, community and structural influences (5).

The impact of parents and family members harmful alcohol consumption patterns on youth is closely linked to long-term physical, economic and societal harms (6);(7). In addition, evidence have also linked harmful use of alcohol consumption with its correlation to parenting techniques (8);(9);(10). For instance, single parent household and parental monitoring, all correlates with the different levels of youth drinking behaviours (11);(12);(13);(14). Other ecological factors such as peer influence, gender differences (15) and ethnicity (16) also play pivotal roles in harmful alcohol consumption.

In terms of peer group influences; studies attempt to determine the role of individual decision-making versus peer pressure to adopt group norms when explaining how and why many young people come to drink like their peers (17).

In addition, the cultural, social context and norms also have a certain impact on ethnic groups and their alcohol consumption patterns (3);(18);(19). For example, Bich and colleagues investigated patterns of alcohol consumption across population groups within the Asian region; the countries surveyed included Bangladesh, Indonesia, India, Vietnam and Thailand. The results from Bich study, indicated that alcohol is infrequently consumed in some regions of Bangladesh and Indonesia; but, the prevalence of alcohol consumption is relatively high across Vietnam and Thailand (20).

Bich et al, findings indicate the importance of ethnic and cultural factors in patterns of alcohol consumption. This is also evident in multi-ethnic countries like Malaysia. Malaysian Population and Housing Census in 2010; indicated that the ethnic breakdown in the country comprises a majority Malay-Muslim population (67%), with Malaysian Chinese (25%), Malaysian Indian (7%) minorities and a small catch all group of 'others' who make up the remaining 0.7%. The Malaysian Ministry of Health reported that at national level there was a low prevalence of alcohol consumption; the equivalent of about 0.8 litres of pure alcohol per person (age 15+) based on data from 2003-2005 (21). With a predominantly Malay-Muslim population there is an expectation that because of the religious prohibition against the consumption of alcohol, abstinence is high and in some national surveys only the non-Muslim population was asked to respond to alcohol consumption behaviours (22).

By 2011, the Malaysian National Health and Morbidity Survey reported that the prevalence of alcohol use was 12% (21). From early 2000 to 2014, there were evidence that 45% of Malaysian youth were alcohol consumers and half of these consumers were known to be binge drinkers (23);(24);(25);(26) From 2012 to 2015, the local government adapted classification on alcohol consumption patterns as per the following table 1.[1]

Table 1: Alcohol units and classification

Units		Classification
Minimum of 2 drinks	Daily	Low risk
3-4 drinks		Moderate risk
More than or equal to 5		High risk
< 15units	Weekly	Low alcohol drinking
>15units or more		Moderate to heavy alcohol drinking
6 drinks (at one occasion)	Binge	Binge drinking for both male and female

Within Malaysian context one standard drink of alcoholic beverage contains 10g of pure alcohol.[2]

Based on the above definition, Malaysian government continued to indicate that the binge drinking patterns may have been noted amongst youth in all ethnic groups such as the Chinese, Indians and Malays - but such risky consumption patterns were much lower once the Malays transitioned into working adults within the age range of 30-34 years old. Since Malays were the dominant ethnic group in Malaysia, the national alcohol dependence prevalence remained low at 1.2% (21). Contradictory to this, local studies continued to stress the fact that the national data may not reflect the actual consumption patterns within the communities and lack of enforcement continue to escalate the risky consumption patterns among those who may consume at a riskier level (27);(28). In 2015, local study amongst youth aged 15-24 years old, residing in the capital city of Malaysia - reported that 28% [*N*=150] of the youth who were consuming alcohol started consumption at the age of 17. Among those who were consuming alcohol - 14% indicated that alcohol consumption patterns were also observed within their respective families. This study concluded its findings by stressing on the fact that lack of knowledge on effects and risky alcohol consumption patterns is evident within Malaysian youth (29).

Based on limited evidence that is available locally; it is eminent that riskier alcohol consumption patterns are explored especially amongst specific age or ethnic groups. Therefore, understanding contributing factors that may develop into harmful behaviours is warranted. This study is designed to explore ecological factors on youth alcohol consumption patterns from three main ethnic groups. The research team, aimed at drawing theories of ecology of human development (30) and social learnings - within the context of social control in a non-judgemental settings such as community environment where youth often congregate. The specific objective of this study is to investigate patterns of alcohol consumption and influences of family and friendship groups on alcohol consumption amongst Malaysian youth.

METHODS

The conceptual framework used to explore alcohol consumption was based on an ecological model of public health that was further defined by Bronfenbrenner in 1979- where he emphasized that four contextual systems such as micro, meso, exo and macro were essential component of human development (5). For the purpose of this study, the micro and meso component is explored using

[1] Institute of Public Health (2008), The Third National Health Morbidity Survey (NHMS III) 2006, Putrajaya, Ministry of Health Malaysia.

[2] Malaysia KK (2013). GARIS PANDUAN SARINGAN DAN INTERVENSI PENCEGAHAN DAN PENGURANGAN KEMUDARATAN ALKOHOL. Unit Alkohol dan Substans, Sektor MeSVIPP, Bahagian Kawalan Penyakit (NCD).

Youth Risk Behaviour Survey [YRBS] – developed by CDC. The intention of this study is to collect data using a methodology that might draw out the ecology of youth drinking behavior, identifying the relationships that supported drinking, without necessarily providing nationally representative point estimates. Therefore, the use of YRBS was mainly aimed at monitoring priority health risk behaviours that are closely related to alcohol consumption among youth. In addition, the research team wanted to ensure that local youth were familiar with a survey tool; thus, justifying the use of this tool that have been used in Malaysian schools since 2009. It was hoped that, the use of a familiarised tool would also address the perceived social sanction and stigmatization on alcohol consumption patterns within local context. Such, measures was also necessary to address issues which may hinder the response rate. It is important to note that issues on underreporting and accuracy of self-reporting within a stipulated timeline needs to be taken into consideration especially within young adults because this may have direct implications on social desirability biases (31);(32). Thus, minor adaptations were applied to this tool with emphasis on alcohol consumption patterns that also explores parents and peers consumption patterns. Adapted questionnaire consisted 41 questions assessing socio-demographics [q1-6], alcohol use [q22-27], family alcohol consumption patterns [q28-32] and peer consumption patterns [q38-41]. In order to address the study objective; only alcohol use, family and peer alcohol consumption patterns are presented here.

Sampling

Geographic mapping was carried out to identify six localities in five sites within the Klang Valley by utilizing data from the Population and Housing Census of Malaysia 2010. The selection was based on categorizations of urban/semi-urban area and density of respective ethnic groups. Areas with a population density of identified ethnic group below 5,000 were considered semi-urban, while a density of more than 5,000 was considered urban. The selected five sites 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 were identified, metropolitan sites were mapped out to identify places where youth congregate and socialise with each other.

Multi facet sampling was applied to identify respective youth. Initially stratified sampling was applied to identify youth of required ethnic groups. Followed by, convenient sampling which categorised youth by age and gender. Identified individuals were invited to complete a self-administered questionnaire. Inclusion criteria were: 1] belong to the age group 18-25 years, and 2] able to speak and read English and/or Malay. Exclusion criteria were: 1] refuse to give informed consent, and/or 2] severe medical problem preventing participation [*visible mental or physical health which may hinder participation was considered as exclusion criteria*].

Sample size was originally calculated using an expected current drinking [including binge drinking] prevalence of 50%. The current sample of 326 youths estimated of the proportion of risk or drinking with an accuracy of 5% and a power of 95%, considering the current population prevalence of 32.5%. Overall response rate was 52.5%.

Ethical approval was obtained from Perdana University Institutional Review Board and Monash University Human Research Ethics Committee in Malaysia. Written consent was sought and granted from participants explicitly via consent forms prior to participating in the study.

Measures

The dependent variable of interest in the current analysis was defined as “pattern of alcohol consumption”. In this study, alcohol consumption was categorised into three patterns of 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 30 days prior to completing the survey – not inclusive of binge drinker. “Binge drinker” was defined as those who had consumed five or more alcoholic drinks over a period of couple hours in the last 30 days prior to completing the survey.

The independent variables were identified as “family influence”, “social influence”, “ethnicity”, age and “gender”. Family influence on alcohol consumption was defined as having one or more immediate family members who consumed alcohol. Social influence on alcohol consumption was defined as

having one or more friends who consumed alcohol. To reflect Malaysia's multi-ethnic background, "ethnicity" was grouped into three categories: Chinese, Indian and Malay's.

Statistical Analysis

Data were analysed using Statistical Package for Social Studies, version 22 [SPSS IBM, NY]. Descriptive analyses were performed to calculate the mean age of male and female participants, as well as the frequency and percentage of ever-drinkers, current drinkers, and binge drinkers. Further analyses included Pearson's Chi-squared test of independence to identify factors that were significantly associated with patterns of alcohol consumption. Level of significance of all the tests was taken as p-values of less than 0.05 [two–tailed]. Significant variables were selected for further evaluation using multiple logistic regression.

RESULTS

Socio demographics of the total study population and drinking status [never drinkers/ever drinkers/ current drinkers/binge drinkers] are summarised in Table 2.

Socio-demographics, social influence and family influence in drinking

The mean age in this sample was 20.57[SD=2.174].The study population comprised of 171 males [52%] and 155 females [48%]. About half of the study population were enrolled in high school, foundation, certificate or diploma courses, 28.8% of them were pursuing degrees or postgraduate degrees and 16.3% indicated "others" with no further details or did not provide any response. Nearly 50% of the youths knew friends who consumed alcohol and 17.8% of them choose not to provide any information on this. While 44.8% of the youths admitted that 1 or more of their family members consumed alcohol; about 24.8% of them choose not to provide any information on this variable.

Table 2: Characteristics and alcohol consumption patterns among 326 participants

Variables (Sociodemograpy and influences)	Total N=326		Never drinker N=171		Ever drinker N=49		Current drinker N=41		Binge drinker N=65	
Age, mean (SD)	20.57	(2.174)	20.2	(2.141)	20.96	(2.189)	21.44	(2.169)	20.72	(2.073)
Education, n(%)										
high school, foundation, cert	70	(21.5)	48	(28.1)	9	(18.4)	5	(12.2)	8	(12.3)
Diploma	109	(33.4)	66	(38.6)	10	(20.4)	5	(12.2)	28	(43.1)
degree,master,graduate, phd	94	(28.8)	35	(20.5)	22	(44.9)	17	(41.5)	20	(30.8)
did not answer (others,missing)	53	(16.3)	22	(12.9)	8	(16.3)	14	(34.1)	9	(13.8)
Ethnicity, n(%)										
Malay	103	(31.6)	88	(51.5)	6	(12.2)	4	(9.8)	5	(7.7)
Chinese	111	(34.0)	27	(15.8)	29	(59.2)	30	(73.2)	25	(38.5)
Indian	112	(34.4)	56	(32.7)	14	(28.6)	7	(17.1)	35	(53.8)
Gender,n(%)										
M	171	(52.5)	73	(42.7)	20	(40.8)	27	(65.9)	51	(78.5)
F	155	(47.5)	98	(57.3)	29	(59.2)	14	(34.1)	14	(21.5)
Social influence,n(%)										
No	112	(34.4)	89	(52.0)	9	(18.4)	8	(19.5)	6	(9.2)
Yes	156	(47.9)	53	(31.0)	36	(73.5)	27	(65.9)	40	(61.5)
Missing	58	(17.8)	29	(17.0)	4	(8.2)	6	(14.6)	19	(29.2)
Family influence, n(%)										
No	99	(30.4)	104	(60.8)	20	(40.8)	12	(29.3)	10	(15.4)
Yes	146	(44.8)	27	(15.8)	25	(51.0)	17	(41.5)	30	(46.2)
Missing	81	(24.8)	40	(23.4)	4	(8.2)	12	(29.3)	25	(38.5)

Drinking patterns across gender and ethnic groups

In the current drinker and binge drinker groups, male youths surpassed their female counterparts at 65.9% and 78.5% respectively. Across the groups, the Malays made up the highest proportion of never drinkers at 51.5%, and the lowest proportions in ever drinkers [12.2%], current drinkers [9.8%] and binge drinkers [7.7%]. The Chinese made up the highest proportion of current drinkers at 73.2% whereas in binge drinkers, the Indians made up the highest proportion at 53.8%.

Influencers of binge drinking

The never drinkers, ever drinkers and current drinkers were collapsed to form the non-bingers category in Table 3. Chi-squared tests were used to assess differences in proportions between non-bingers and binge drinkers for categorical variables of education, ethnicity, gender, social and family influence. Differences in the proportions of ethnicity, gender, social and family influence were found to be statistically significant between non-bingers and bingers [p<0.001].T-test was used to assess the differences in mean of age between non-bingers and binge drinkers but this was not statistically significant [p=0.523]. More than half [61.5%] of the youth reported the fact that their friends were more likely to be binge drinkers. Where by, 46.2% of youth who were binging reported that similar consumption patterns were observed in their families as well.

Table 3: Characteristics and influences in the study population according to non-bingers and binge drinking groups

Variables (Sociodemographic and influences)	Non-bingers N=261		Binge drinkers N=65		p-value
Age, mean (SD)	20.54	(2.2)	20.72	(2.073)	0.523
Education, n(%)					0.12
high school, foundation, cert	62	(23.8)	8	(12.3)	
diploma	81	(31.0)	28	(43.1)	
degree,master,graduate, phd	74	(28.4)	20	(30.8)	
did not answer (others,missing)	44	(16.9)	9	(13.8)	
Ethnicity, n(%)					<0.001
Malay	98	(37.5)	5	(7.7)	
Chinese	86	(33.0)	25	(38.5)	
Indian	77	(29.5)	35	(53.8)	
Gender,n(%)					<0.001
M	120	(46.0)	51	(78.5)	
F	141	(54.0)	14	(21.5)	
Social influence,n(%)					<0.001
No	106	(44.4)	6	(9.2)	
Yes	116	(40.6)	40	(61.5)	
missing	39	(14.9)	19	(29.2)	
Family influence, n(%)					<0.001
No	136	(52.1)	10	(15.4)	
Yes	69	(26.4)	30	(46.2)	
missing	56	(21.5)	25	(38.5)	

Bivariable analysis

In Table 4, bivariable analysis using logistic regression showed that Chinese and Indians were more likely to be binge drinkers than the Malays [OR for Chinese=5.698, p=0.001, 95% CI=2.09-15.533; OR for Indians=8.909, p<0.001, 95% CI=3.332-23.819]. Males were 4 times more likely than females to be binge drinkers [OR=4.28, p<0.001, 95%CI=2.258-8.114]. Youths who report having social and family influence were about 6 times more likely to be binge drinkers [OR for social influence=6.09, p<0.001, 95% CI=2.483-14.947][OR for family influence=5.91, p<0.001, 95% CI=2.732-12.797]. For the youths who refused to provide information on social and familial influencers of drinking, they were

also more likely to be associated with binge drinking compared to those who reported to have no influencers [OR for missing social influence=8.61, p<0.001, 95% CI=3.203-23.129; OR for missing family influence=6.07, p<0.001, 95% CI=2.737-13.467].

Table 4: Bivariable and multivariable logistic regression of association of ethnicity, gender, social and family influences with binge drinkers

Variables	Unadjusted			Adjusted model		
	p-value	OR	95% CI	p-value	OR	95% CI
Ethnicity (base-Malay)						
Chinese	0.001	5.70	2.09-15.53	0.013	3.92	1.34-11.47
Indian	<0.001	8.10	3.33-23.82	0.001	5.9108	2.07-16.83
Gender						
Male	<0.001	4.28	2.26-8.11	<0.001	4.18	2.08-8.40
Social influence						
Yes	<0.001	6.09	2.48-14.95	0.081	2.52	0.89-7.09
missing	<0.001	8.61	3.20-23.13	0.069	2.10	0.92-9.77
Family influence						
Yes	<0.001	5.91	2.73-12.80	0.032	2.65	1.09-6.65
missing	<0.001	6.07	2.74-13.47	0.056	2.68	0.97-7.37

OR: Odds ratio, CI: Confidence interval

Note: The analysis including age and education with the estimates on factors of interest were invariant.

Multivariable analysis

In the adjusted model of Table 4, ethnicity, gender and the family influence variable remained statistically significant in its association with binge drinking even though the reported odds ratio decreased. The Indian youths were nearly 6 times more likely than the Malay youths to be associated with binge drinking [OR=5.908, p<0.001, 95% CI=2.073-16.833], whereas the Chinese youths were nearly 4 times more likely to be binge consumers [OR=3.916, p=0.013, 95% CI=1.337-11.472]. Male youths were 4 times more likely to be associated with binge drinking [OR=4.185, p<0.001, 95% CI=2.084-8.402]. Youths with family influences in drinking were 2.65 times more likely to be associated with binge drinking [OR=2.65, p=0.032, 95% CI=1.086-6.646]. After including family influences, social influence was not statistically significantly associated with binge drinking.

DISCUSSION

The findings of this study indicate that independent and other factors with the influence of an immediate family member who consumes alcohol was greater than peer influence. Although peer pressure may contribute to youth alcohol use, family environment exerts more effect on this behaviour. Findings from Finland and the USA, found that parenting techniques is an important mediator between parental and adolescent drinking practices (33);(34);(35). In Malaysia, comparable findings were also reported in much younger adolescents between the ages of 11 and 20 years(36). In fact, Wan et al, study reported that parents or elder sibling's alcohol consuming behaviour was significantly associated with alcohol consumption among school going adolescents in Kuala Lumpur, Malaysia (38). Such ecological association of family influences and behaviour may be explained by Asian cultural norms where family plays an important role in hierarchical familial structures and filial piety (39) – which is found in moral values asserted to children within the national educational system (40).

In this study, alcohol use among Malays across all three categories of alcohol consumption was significantly lower than in the other two ethnic groups. This could be due to the fact that previous local studies have relied exclusively on large national, usually government surveys such as the Household Expenditure Survey and the National Health and Morbidity Surveys. Until recently, these surveys explicitly excluded Malays from answering questions on alcohol consumption (21), because it is illegal

for them to consume alcohol (28). Such reflection of the religious prohibition in Islamic beliefs, are unrelentingly evident within local studies (23);(37);(41);(28). Thus, the findings from this study indicated that out of 103 Malay respondents 15% have consumed alcohol with 9% of them categorised as binge consumers. The percentage of consumer in this study is about 10 times higher than the prevalence of 0.9% among current Malay consumers reported by the National Health and Morbidity Survey [NHMS], Malaysia 2011 (21);(42). However, there is a need to apply caution to this findings because current study was only carried out in certain areas and among small number of youth. In addition, the participants were within the age range of 18-25 years old- who may exhibit hazardous levels and display a higher prevalence of alcohol-related conditions. Similar, issues on volume and riskier consumption patterns which peaked in the late teens or early twenties; was also noted among young adults in Australia (43).

Equally, there is sufficient evidence that risky alcohol consumption patterns continue to be dominant among the non-Malays (21);(42);(38). For the Chinese youth in this study, it's not a surprising to find most have tried alcohol once in their lifetime since alcohol consumption is part of most traditional Chinese celebrations (41);(44) - thus, consumption is noted as part of societal practices and almost half of the youth continue to be current consumers (45). However, fewer Chinese were found to be binge drinkers, compared to Indians. This is also consistent with other studies that reported high consumption of alcohol and riskier consumption patterns among Malaysian Indians (46);(21). The cycle of risky alcohol consumption patterns seems to dominate amongst the Indian youth- since, they are more likely to have the highest number of family members who consume at a harmful level as well. Similar risky alcohol consumption patterns are also noted as public health problem in India (47).

The gender differences in alcohol consumption found in this study is consistent with other studies conducted in Malaysia (20);(29). Males may consume alcohol more than females and this may closely related to biological, social and cultural implications (48);(49);(50). However, it is important to note that like other countries, the alcohol consumption patterns among young Malaysian female's might evolve as well; since, the findings from this study clearly indicates that 36% of them have tried alcohol in their lifetime (51).

CONCLUSION

Alcohol consumption is prevalent among Malaysian youth aged between 18 and 25 years old. Family influences seem to be greater than peer influences in determining risky alcohol consumption patterns. While there are ethnic and gender differences in consumption patterns; such consumption level, is noted within all three ethnic groups.

Measures to reduce harmful alcohol behaviours need to be targeted at all ethnic groups in Malaysia. Interventions to educate young people and address risk associated to risky alcohol consumption is required. Stigmatization, sensitivity, cultural norms and prohibition around alcohol consumption within the country need to be guided through evidence. Study such as this may inform the development of effective and comprehensive youth alcohol policies or strategies which are guided by in-depth knowledge of relevant ecological factors that influence alcohol consumption and drinking behaviour.

Family members should be educated on the harm associated with risky alcohol consumption patterns, especially within their family environment. There is a need to continue to build evidence on the impact of family influences on alcohol consumption within all ethnic groups –while addressing the need to integrate interventions that are directed at both genders.

LIMITATIONS

The above mentioned study has meet its aim; however, there were some limitations. For instance, the small size of this study only illustrates the youth patterns within specific studied areas in Klang Valley, Malaysia. In addition, the sampled number of youth in respective ethnic group was almost the same; this was to ensure ethnic representation was adhered. However, it is important to note the general ethnic group make up in Malaysia is 67% Malay, 25% Chinese and 7% Indians, followed by others. The study also points out the due recognition on retrospect measure of family wealth would have

been useful. Finally, the potential under-reporting on alcohol consumption patterns is cautioned since this is a socially sanctioned issue in Malaysia.

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6.2 Summary of findings

This study finding clearly illustrated the fact that family normative influence was much greater than of the peers. Riskier consumption patterns were dominant among Chinese and Indians youths. Even though, there were only a small number of Malay youths who consumed alcohol in this study; the number of consumers superseded the national prevalence among current Malay consumers. Nevertheless, riskier consumption patterns among those who consumed alcohol were alarming across all ethnic groups and such concerns are notable since consumption patterns are evolving within both genders.

Findings from this section specify the need to comprehend the evolution of consumption patterns and the risk associated with this type of behaviour that may impact youth's intrapersonal ecology. The following chapter; which is also submitted as a manuscript to Journal of Alcohol, Elsevier aims to address intrapersonal determinants factors of youths who consume alcohol at a riskier level.

CHAPTER SEVEN: INTRAPERSONAL FACTORS, ESPECIALLY AMONG BINGE CONSUMERS

Based on the findings from chapter five and six, the social environmental and normative influences seem to be prominent factors among youth who are classified as current and binge consumers. However, the risky health behaviours among binge consumers can lead to a myriad of behavioural risk factors and alcohol-related negative consequences. Therefore, an insight on determinants of harmful alcohol consumption patterns and associated behaviours among young Malaysian adults who consume alcohol is equally essential.

This manuscript aims to obtain further insight into riskier consumption determinants especially among young Malaysian adults who consume alcohol in the researched areas. This study manuscript is drafted as part of the manuscript that is submitted to Alcohol, Elsevier. ISSN: 0741-8329. The submission was acknowledged on 5th March 2018.

7.1 Introduction

The level of alcohol consumption Malaysia was 0.8L/capita, whereas, other countries such as Thailand is at 6.8L/capita, India 3.6L/capita, Singapore 1.0L/capita, and Indonesia at 0.6L/capita (Monzavi, Afshari, & Nadeem, 2015). 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 (84.3%) Indonesia (World Health Organization, 2011). In addition, local newspapers and researchers are suggesting that Malaysia was the tenth largest alcohol consumer in the world (Mohd, Munirah, & Shahdan, 2015);(Fadzli & Amer, 2014);(Christina Tan, 2016, July, 21);(Mohamed, Marican, Elias, & Don, 2008). 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 (Mutalip et al., 2013). 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 (Mutalip et al., 2013).

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 (Miller, Naimi, Brewer, & Jones, 2007);(Windle, 2016);(Kohli et al., 2017);(Stamates & Lau-Barraco, 2017);(Coulter, 2017). 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(Castilla, Barrio, Belza, & de la Fuente, 1999);(Miller et al., 2007).

While there is some local, Malaysian, evidence which reports on the youths' alcohol consumption and their alcohol-related behaviours, there are significant shortcomings in these studies. Except for Manickam 2014, all the studies relied on large government surveys and did not focus on youth (Manickam, Abdul Mutalip, Hamid, Bt Kamaruddin, & Sabtu, 2014). 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 – upward biasing any population estimates, is further affecting a complete understanding of such behaviours (Cheah, 2015). 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 (Fadzli & Amer, 2014);(Mohd, Munirah, & Nurul Afiqah Shahdan, 2015);(Mutalip et al., 2014).

Among the limited Malaysian research that did look at youth alcohol consumption patterns, the studies were mainly centred around school-based, student health surveys (Manickam, 2014). 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. In addition, 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 youth (Wan, Kaur, Amal, & Lim, 2005);(Manaf, 2012);(L. K. Lee, Chen, Lee, & Kaur, 2006). 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 (Cheah, 2014);(Korttein, 2008).

In order to address the shortcomings in local studies, there is a need to develop an evidence base which draws on community-based studies of youth and alcohol use which could inform the design and implementation of targeted interventions (Hawkins, & Richard, 2011);(Flewelling et al., 2013);(Holmila & Warpenius, 2012);(McLeroy, Norton, Kegler, Burdine, & Sumaya, 2003). It is hoped that by understanding alcohol consumption patterns in different 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 (Medicine, Education, Families, & Youth, 2002);(Holder et al., 2000);(Wandersman & Paul, 2003). This study aims to obtain further insights into neighbourhood patterns of harmful alcohol consumption and other associated behaviours among young Malaysian adults.

7.2 Methods

For this study, patterns of unhealthy alcohol consumption were explored with an adaptation of the Youth Risk Behaviour Survey [YRBS] – developed by the Centre for Disease, Control and Prevention (CDC, 2011). The YRBS is primarily designed to monitor priority health risk behaviours among youth and was used in Malaysian schools study in 2007 and 2011 (Lee, Chen, Lee, & Kaur, 2007);(Johari, Roslan, Nudin, & Saidin, 2011).

The questionnaire contained 41 questions which assessed socio-demographics [q1-6], actions resulting in unintentional injuries [q7&8], behaviours resulting in violence [q9-13], tobacco use [q14-19], electronic vape use [q20&21] and alcohol use [q22-27].

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 youth 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 youths in each locality. Initially, probability sampling was used to identify the youth of a required ethnic group. Followed by, convenience sampling which categorized youth 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 youths 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.

Ethics Approval

Ethical approval was obtained from the Perdana University Institutional Review Board [PUIRBHR0081 and PUIRBHR0083] and Monash University Human Research Ethics Committee in Malaysia [CF/14/3510-2014001851 & CF/16/762-2016000369]. Written consent was obtained prior to participation.

Measures

Population characteristics

The youth 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 and contribute to unintentional injuries and violence were assessed in the survey. The association between binge drinking and the following variables were evaluated:

- Smoking: “During the past 30 days, how many days did you smoke cigarettes?” Youths 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 period of couple hours in the last 30 days before completing the survey.

Statistical Analysis

Data were analysed using Statistical Package for Social Studies, version 22 (SPSS IBM, NY). Differences in baseline characteristics of the study population were compared using the $\chi 2$ 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.

7.3 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 (refer to 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 youths who have consumed alcohol; out of which 49 (15%) youths who 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 UK definition, a beer contains up to two units of alcohol. On this basis, the youths 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 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 17 below;

Table 17: 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	

	Total(N=326)		Not binge(N=261)		Binge(N=65)		p-value
	n	%	n	%	n	%	
Drove a vehicle while under the influence (n=323)							<0.001
No	268	83.0	238	91.5	30	47.6	
Yes	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	

Multivariable logistic regression

After adjustment for gender and ethnicity, all the risky behaviors were statistically significant in their association with binge drinking, with a graded association for the cumulative number of risky behaviors and association with binge drinking still evident (Table 18).

Table 18: 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

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. Youths 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 youths, 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 behaviors, the higher the odds of them being binge drinkers (OR= 28.6, 95%CI=9.52-85.93) in youths with 4 or more risky behaviors; followed by (OR =6.88, 95%CI=2.68-18.34) in youths with 2-3 risky behaviors.

7.4 Discussion

The study found that almost half (48%) of the youths surveyed in the six selected neighborhoods have consumed alcohol. The binge consumption patterns were higher (20%) compared to other youth-based studies that projected a prevalence of binge drinking between 9% and 14% (Wan et al., 2005);(IPH, 2008);(Al-Naggar, Bobryshev, & Mohd Noor, 2013);(Manickam et al., 2014);(Idayu, Hussain, Wan, Rusdi, & Tahereh, 2014). Similarly, associated risk behaviours of youths in this study were similar or much more common than in a study done in 2006 in university students with a mean age of 21.3-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 (Liew, Noor, Raymond, Nadzrah, & Moy, 2011).

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% (Lu et al., 2015). 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 (Ahlstrom & Osterberg, 2004).

Concerns revolve around the fact that youth 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 behaviors and substance use are prominent factors among road fatality victims in Malaysia (Wong, 2011);(Lasimbang et al., 2017).

This study is not without its flaws. The primary issue that was encountered was the potential for bias of self-reporting amongst the youth. 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 in 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 generalized. The response rate (52.5%) was low, and this too may affect the extent to which results can be generalized. This is a common trade-off when investigating socially challenging topics, which alcohol consumption is in Malaysia.

7.5 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 centers within the communities where youths reside in (Lasimbang et al., 2017);(Wan et al., 2005);(Assuntha, 2001);(MI & Amer, 2014);(Mohd et al., 2015). Similarly, global evidence also concurs to the fact that the use of community-based interventions to address substance use and risk-taking behaviors amongst the youth is warranted (Babor, 2010);(Wandersman & Paul, 2003);(Holder et al., 2000);(Foxcroft et al., 2003);(Hawkins, Catalano, & Arthur, 2002).

7.6 Disclaimers:

The following is an author's statement; hence views expressed in the submitted article are the teams and not of an official position of the institution or funder.

7.7 Source of support:

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7.8 Conflict of interest declaration:

The authors confirm there are no conflicts of interest pertaining to the article.

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CHAPTER EIGHT: INTRAPERSONAL AND INTERPERSONAL FACTORS OF YOUTH ALCOHOL CONSUMPTION AND TOBACCO USE

8.1 Background

As per the findings discussed in previous chapter and global evidence have shown that alcohol use is associated with shared risk behaviors such as tobacco use, which is usually prevalent among young users (Falk, Yi, & Hiller-Sturmhofel, 2006; Sher, Gotham, Erickson, & Wood, 1996);(Jackson, Sher, Cooper, & Wood, 2002);(Drobes, 2002); (Wray, Merrill, & Monti, 2014);(Gritz et al., 1998);(Myers & Kelly, 2006);(WHO, 2015). At times the prevalence of each of these substances is studied independently, and even then, the results are quite concerning. For instance, there is sufficient evidence on the harms associated with smoking over the last few decades (Sopori, 2002);(Huxley & Woodward, 2011);(Giovannucci, 2001); however, tobacco use continues to escalate among the youths (WLF, 2015). The smoking prevalence among youth is worrying because those who smoke cigarettes, are now experimenting or transitioning into different tobacco products such as electronic cigarettes/vape[16], shisha/hookah[17] (Health, 2017) which are more widely used in South East Asian countries (Sinha, Palipudi, Rolle, Asma, & Rinchen, 2011);(Singh et al., 2017).

As mentioned above, from the late 90's, researchers have reported evidence that highlights the importance of monitoring dual substance use among young adults (Drobes, 2002);(Myers & Kelly, 2006);(K. J. Sher et al., 1996);(Falk et al., 2006). For instance, US national prevalence recorded 35% of males and 26% of

[16] Electronic cigarettes, also known as e-cigarettes, e-vaporizers, or electronic nicotine delivery systems, are battery-operated devices that people use to inhale an aerosol, which typically contains nicotine (though not always), flavorings, and other chemicals. Source: National Institute on Drug Abuse; National Institutes of Health; U.S. Department of Health and Human Services.

[17] Shisha smoking – also called hookah, narghile, waterpipe, or hubble bubble smoking – is a way of smoking tobacco, sometimes mixed with fruit or molasses sugar, through a bowl and hose or tube. Source: British Heart Foundation: https://www.bhf.org.uk/heart-health/risk-factors/smoking/shisha

females who used these two substances peaked among youths within the age range of 18 to 24 (Falk et al., 2006). Similarly, a study from China indicated that university students who were current smokers were more likely to consume alcohol (Abdullah, Fielding, & Hedley, 2002). This supports the argument that it is hard to ignore the association between tobacco use and alcohol co-dependence among young adults.

8.1.1 Malaysian Tobacco Use Prevalence

The Global Adults Tobacco Survey (GSHS) in 2011 revealed that an adult in Malaysia smokes at least 14 cigarettes a day and half of the smokers who smoked this amount a day were within the age range of 20-34. A review of smoking research in Malaysia revealed that the prevalence of cigarette smoking among children and adolescents ranged from 20% to 33% (Hum, Hsien, & Nantha, 2016). By 2017, a study on youths aged 16 to 17 from 40 schools in Malaysia indicated that the prevalence rate was at 15% (Lim et al., 2017). Such declining smoking prevalence was also mentioned in the National Health and Morbidity Survey in 2006 (Lim et al., 2013). However, in 2015 the government of Malaysia acknowledged the fact that the declining rate of smoking prevalence within local context may not reflect the use of diverse tobacco products (IPH, 2016). Thus, general surveys were being amended to reflect the popularity of E-cigarettes, which increased from 2% in 2011 to 11% in 2016 (GATS, 2011);(IPH, 2015). In addition, local studies also reported the rise of shisha/hookah use among youths (Al-Naggar & Saghir, 2011);(Khor, Harun, et al., 2012). The prevalence of shisha use was significantly higher among secondary school students ranging from 5-12% in Malaysia (IPH, 2016);(Mydin, Hairi, Amin, & Nordin, 2015).

8.1.2 Co-dependence use of alcohol and tobacco

Local studies have also at times explored the co-dependence of alcohol and tobacco use among young Malaysian. For instance, the team from Institute of Public Health Malaysia reported that the prevalence of binge consumers was at 5.7% among the general population with half of them saying they use tobacco (Mutalip, Naidu, Kamaruddin, Ab Hamid, et al., 2013). Another study in 2014, reported that Malaysian adolescents within the age range of 12 to 17 were two times more likely to be current smokers and alcohol consumers (Tee & Kaur, 2014). Hence, there is interest in understanding the concurrent use of these two substances among the youth within the local context. However, there is also a general belief that such simultaneous use is predominantly among some at-risk groups, such as young adults mainly among the Chinese and the Indians (Mutalip, Kamarudin, Manickam, Hamid, et al., 2014);(Kortteinen, 2008);(Jernigan & Indran, 1997):(Malaysia Assuntha, 2001). Also, such concurrent use is also noted

amongst youths who are now engaging in shisha/hookah phenomenon (Hamilton et al., 2015);(Tamim et al., 2007);(Primack, 2011). This is concerning since there is evidence that indicates that shisha prevalence is at 30% among local youths (Al-Naggar & Saghir, 2011);(Al-Naggar et al., 2013).

Hence, there is a need to investigate associated risk factors related to different type of tobacco and substance use within the local context, especially since tobacco use prevalence is transitioning from one product to another. Keeping that in mind, the present study reflects the concurrent use of different tobacco products among Malaysian youth within the age range of 18 to 25. It is hoped that these findings may be useful for public health policymakers and academic researchers who could form evidence-based strategies to address interventions to tackle this sensationalized growing phenomenon amongst Malaysian youth.

8.2 Methodology

The methodology adopted in this phase of the study is mentioned in Chapter 4, 6, 7 and is also published in the International Journal of Adolescent Medicine and Health.

8.2.1 Definition of variables

The methodology adopted in this phase of the study is mentioned in Chapter 4, 6, 7 and is published in part of the manuscript that is in print with the International Journal of Adolescent Medicine and Health; Ref No IJAMH-.2017.0062.

In this study, socio-demographic variables included “age”, “gender”, “ethnicity”, “current level of education”, “employment status” and “location” is classified against locality where the data was obtained. Alcohol consumption was categorized into three patterns of “ever-drinker”, “current drinker” and “binge drinker”. Similarly, smoking behaviours were categorised into three patterns of “ever smoker”, “current smoker”, and “heavy smoker”. Definitions of these variables are summarized in Table 19 below.

Table 17: Definition of variables

Variables	**Definitions**
Age	Continuous variable ranging from 18 to 25 years old
Gender	Male/female
Ethnicity	Malay/Chinese/Indian
The current level of education	High school; foundation/diploma/degree/certificate; and postgraduate studies.
Employment status	Employed/unemployed
Location	Urban/semi-urban
Ever drinker	Had at least one alcoholic drink in their lifetime
Current drinker	Had consumed at least one alcoholic drink over the 30 days before completing the survey
Binge drinker	Had consumed 5 or more alcoholic drinks over two hours in the 30 days before completing the survey.
Ever smoker	Had ever tried smoking, even one or two puffs
Current smoker	Had smoked cigarettes at least one day during the past 30 days before completing the survey
Heavy smoker	Had smoked more than 20 cigarettes per day during the past 30 days before the survey.
Smoke and Vape	Is a current smoker and also use vape (concurrent use)

8.3 Results

Frist Data Source: Ethnographic Mapping

Alcohol and cigarettes accessibility and availability

Ethnographic mapping in five areas, over six sites revealed that there was more Service Providers (SP) or Outlets (Os) who sold/serve alcohol and cigarettes in Chinese populated areas. For instance, there were approximate 15-77 SP/Os in Cheras and Petaling Jaya, and these providers were located within a 500km radius in urban/semi agglomeration blocks. Whereby, in Indian populated areas such as Ampang and Batu; there are 5-38 SP/Os. As for the Malay populated areas, such as Cheras and Setapak, there were 0-36SP/Os within the same distance. Average operating hours of these SP/Os is approximate 15hours a day. A total of 31 unstructured interviews with SP/Os confirmed that youth within these five localities were actively using

alcohol and tobacco type substances. All SP/Os confirmed that they have sold/serve tobacco type products which are not socially sanctioned in comparison to purchasing alcohol type products within these communities. Most (41.9%) of the SP/Os also confirmed that the currently preferred tobacco type product was vape, followed by shisha and cigarettes. Some (35.5%) of the SP/Os also shared the fact that younger adolescents (*school going children, within the age range of 12 to 14 years*) do purchase cigarettes, and then they distribute equal numbers of cigarette sticks among their respective friends. However, field observation revealed that young adults within the age range of 18 to 25 years were more inclined to use vape or shisha. Some (*n*=11) of the shisha suppliers or SPs, claimed that they apply creative marketing gimmicks to attract the young crowd (*young adults within the age range of 18-25*). Some of the marketing gimmicks are focused on packaging deals that offer free soft drinks with every purchase, while other tricks are applied by creating exquisite shisha bottles. Few of the gimmicks discussed revealed that the shisha water bowl was replaced with liquor bottles.

In addition to the interviews with SP/Os, the researcher also recorded field observation and mapped out 151 SPs in all five areas over six sites. Findings from these field visits are mentioned in chapter five. However, in this section; the researcher will elaborate the mapping component that precisely captured the accessibility and availability of tobacco products at food outlets. Cigarettes were available at all 151 SP/Os. Also, there were cashier counters that serve/sell cigarettes at all outdoor food outlets. Teenagers and young adults were able to purchase cigarettes, even though there was signage that specifies age restriction sales to those who were underage. Approximately 51% of SP/Os displayed signage that emphasized age restrictions at their premises. The field investigation revealed the fact that shisha and vape were widely preferred products among the youths. Thus, these two products were the primary focus of the inquiry in the following phase of the study.

Shisha and vape accessibility and availability

In addition to the 151 SP/Os, there were an additional 46 stand-alone shisha SP/Os at these five areas that spread out over six sites. In contrast, to the alcohol SP/Os which were predominantly in Chinese populated areas, there was more shisha (*n=24)* and vape SP/Os (*n*=14) outlets in Malay populated areas. The remaining six outlets were noted at Ampang (*n=4)* and Petaling Jaya (*n=2).* There were also shop/off-premise miscellaneous outlets (*n=12)* which specifically sold shisha products. Whereby, supermarkets/99 Speedmart/KK marts in Setapak (*n*=6) and Ampang (*n*=4) also stocked shisha products on their shelves.

Image 8: Vape shop lot, located in Setapak

Shops which stocked vape products were mostly in malls or major shopping arcades (as shown in Image 7). However, there were few (*n=7)* small stalls which sold e-liquid at outdoor food outlets or the side of the streets near food and beverage stalls. The researcher noted four small street-based stalls that sold vapour products in these six sites. Patrons pointed out that these booths were mostly visited by youths.

Second Data Source: Youth Risk Behavioral Survey

The data source in this section is abstracted from quantitative data obtained from Study 1 (YRBS *n*=326) and Study 2 (a Self-Administered questionnaire that also reflects similar questions posed in YRBS *n*=40). The socio-demographic data from both studies are presented in Table 20 below:

Table 18: Demography characteristics from study 1 and 2

Data Source	***Study 1*** ***n (%) or Mean (SD)***	***Study 2*** ***n (%) or Mean (SD)***
Gender		
Male	171 (52.5)	35 (87.5)
Female	155 (47.5)	5 (12.5)
Ethnicity		
Malay	103 (31.6)	18 (45.0)
Chinese	111 (34.0)	9 (22.5)
Indian	112 (34.4)	13 (32.5)
Age	20.57 (2.17)	20.68 (2.15)
Education		
high school, foundation, cert	70 (21.5)	12 (30.0)
Diploma	109 (33.4)	14 (35.0)
university degree, and above	94 (28.8)	11 (27.5)
did not answer (others, missing)	53 (16.3)	3 (7.5)

(Study 1):

Demographics of the study population from *Study 1* can be found in Table 20. There were slightly more males (52%) than females (48%). Ethnic group distribution was almost equal for all three groups at about one third for each group. Regarding education, diploma holders and youths in universities (*equivalent to 13 years of education*) made up for more than 60% of the population. There were 21.5% of teens who completed secondary school (*equal to 10 years of schooling*) education and the rest did not report their educational status. Table 21 illustrates youth tobacco use within respective ethnic groups. Concerning cigarette usage, Indian youths had the highest percentage of heavy smokers (8%), Malay teenagers had the highest rate of current smokers (35%), and Chinese adolescents had the highest percentage of never smokers at nearly 70%.

Concerning vaping, Malay youths reported the highest current and heavy usage. Indian youths and Chinese youths reported similar percentages of current vape usage at 15%, but the rate of heavy vape use was noted among Indian youths (9.9%) compared to Chinese youths (6.3%).

In terms of dual product usage of vape and cigarettes (current and heavy usage); Malay youths reported the highest percentage (28.2%) followed by Indian youths (17.1%) and Chinese youths (10.8%).

Table 19: Cigarette and vape usage by ethnicities in Study 1

	n (%) or Mean (SD)		
	Malay, *n*=103	Chinese, *n* =111	Indian, *n* =112
Cigarette Usage			
Never	49(47.6)	77(69.4)	56(50.0)
Ever	13(12.6)	14(12.6)	21(18.8)
Current	36(35.0)	16(14.4)	26(23.2)
Heavy	5(4.9)	4(3.6)	9(8.0)
Vape Usage			
Never	56(54.4)	81(73.0)	77(69.4)
Ever	5(4.9)	8(7.2)	8(7.2)
Current	28(27.2)	15(13.5)	15(13.5)
Heavy	14(13.6)	7(6.3)	11(9.9)
Smoke or vape			
Never smoke or vape	49(47.6)	81(73.0)	69(62.2)
Vape only	13(12.6)	10(9.0)	7(6.3)
Smoke cigarettes only	12(11.7)	8(7.2)	16(14.4)
Smoke and vape	29(28.2)	12(10.8)	19(17.1)

(Study 2):

Local evidence and study findings indicated that smoking prevalence among local youths is high. Also, the interchangeable use of cigarettes and vape was also foreseeable. However, the shisha use among youth was a disquieting factor. The availability and accessibility of shisha products were prominent at food and beverage outlets (as noted in Image 8). These social phenomena merited investigation. Once ethics approval was obtained, the researcher approached 78 youth who were using shisha at the researched sites, and 40 agreed to take part in *Study 2*. Refusal reason was primarily due to smoking practices was an act of socialisation – thus, the data collection process interrupted time with their friends. For the participants in this study, the gender distribution was skewed (male: 35, female: 5), primarily because most refusals were from female respondents and also for the fact that men were more visible in the vicinities that were mapped. The number of participants from respective ethnic groups was mostly Malays (45%) followed by Indians (32.5%) and Chinese (22.5%). The mean age of the respondents was 20.7 years. Most (62.5%) of the participants have diplomas or are enrolled in higher educational courses (*education beyond high school*). All of the youth who participated in this study were using tobacco products such as cigarettes, vape and shisha interchangeably. Most of the youth (*n*=22) in this study claimed that they initiated tobacco use with cigarettes. Currently, 32% of 40 youths who participated in this phase of the study are using both vape and shisha.

Image 9: **Shisha pipes, visible at a food and beverage outlet in Ampang.**

Concurrent substance use patterns

As stipulated in chapter seven and figure 13 below, smoking patterns are notably prevalent among those who participated in study one. The associated risk factors of alcohol consumption heighten for those who are current and binge consumers. For instance, smokers were 10.82 times more likely to binge drink than non-smokers.

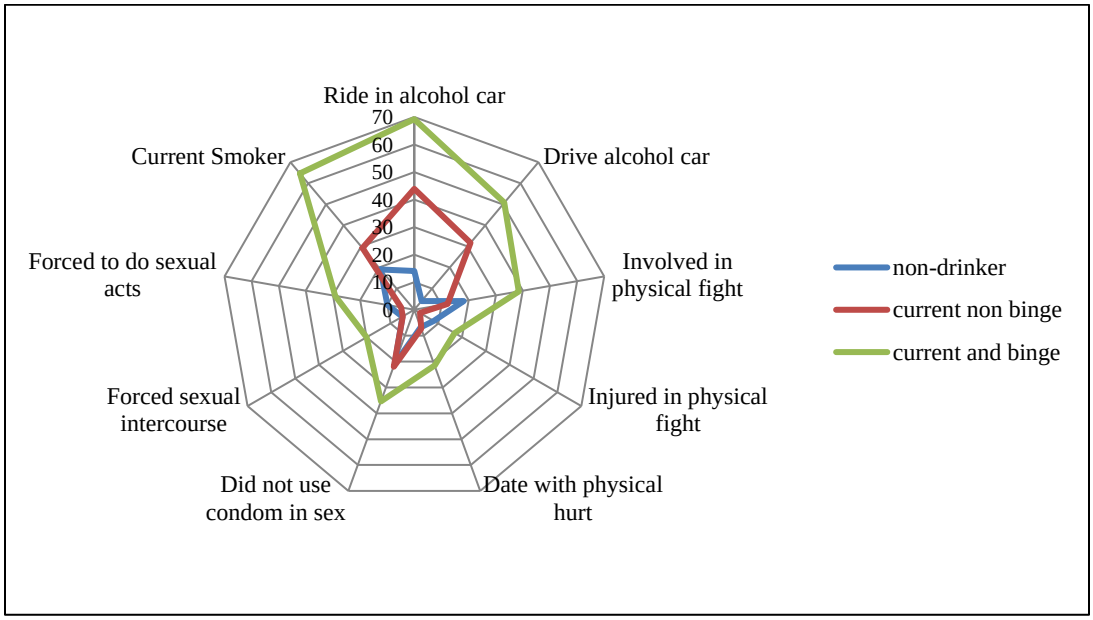

Figure 12: Percentage of associated risk factors among youth who consume alcohol

Among the shisha users, there were 1.7% Malay's (*n*=18) who revealed that they drank alcohol, whereby all Chinese (*n*=19) and Indian (*n*=3) shisha users showed that they are current alcohol consumers.

8.4 Discussion

As stipulated in chapter five and within the results here, the availability and accessibility of alcohol and tobacco products are notably high in all six researched areas. Concurrently, the sales of these dual substances have always been an issue within the local context (Lim et al., 2017);(Mohd, Munirah, & Nurul

Afiqah Shahdan, 2015). However, there are some forms of social gradients where the society frowns upon alcohol consumers but not on smokers. Hence, this accentuates the access and availability of some of the substance use products within specific ethnic groups (Newman, 2010);("Vaping teens - Nation | The Star Online," n.d.);(Lim et al., 2017).

In terms of interpersonal influences, local studies have provided sufficient evidence that confirms the fact that smoking and consumption of alcohol is noted among young Malaysians and the evidence also highlights the implications of friendship/peers influences on such use as well (Dahlui et al., 2015); (Al-Naggar et al., 2013);(Manickam et al., 2014). However, the dose-response relationship among young adults whose parents' use of these two substances are also noted as a predominant factor that is strongly associated with initiation and long-term use (Lim et al., 2017);(Tjora, Hetland, Aarø, & Øverland, 2011);(Akl et al., 2015);(Lee, Paul, Kam, & Jagmohni, 2005).

In terms of intrapersonal factors, there is caution raised by several local studies that the prevalence of smoking which was predominantly among males is now slowly transitioning to females within the local context (Kin & Lian, 2008);(Dahlui et al., 2015);(Manaf & Shamsuddin, 2008);(Picco, Subramaniam, Abdin, Vaingankar, & Chong, 2012). Similarly, belonging to a particular ethnic group was also considered as a dose-response relationship especially when dual substances use comes into play (Teh et al., 2014);(Y. K. Cheah, 2014).

8.5 Conclusion

The clustering risk behaviours with dual substance use among young adults in Malaysia is disturbing especially among specific groups. Nevertheless, such dual use is a complex behaviour which at times is directly linked to youth ecology (Tsai, Hsieh, Strong, & Lin, 2015);(Ennett et al., 2008); (Steketee, Jonkman, Berten, & Vettenburg, 2013). Thus, there is a need to build positive internal and external factors for the youth, with the support of all interrelated linkages within youth ecology. This will further be discussed in the following chapter which aims to convey the relevance of sociocultural, environmental, interpersonal, and intrapersonal influences that have a direct impact on youth substance use.

CHAPTER NINE: DISCUSSION

As a body of the word, this thesis attempts to address questions about risk associated behaviours among youth who consume alcohol within the local context. The following sections in this chapter will integrate the matrix of "Theory of Triadic Influence [TTI]" on each of the study's exploratory findings.

Sociocultural environmental influences

Firstly, this study's results demonstrated the implications of sociocultural environmental influences that directly impact youth consumption patterns and its associated risks concerning health-related behaviours. As described in chapter five; it is hard to ignore the accessibility and availability of alcohol within Chinese and Indian populated areas. The number of outlets of these outlets and unhealthy consumption patterns within the Chinese and Indian ethnic groups is perturbing. For instance, Indians were 9 times and Chinese youth were six times more likely to binge drink compared to Malay youth (Singh, et al., 2017). The negative impact from a high density of alcohol outlets and binge consumption was also cautioned in studies from Australia and the US. For instance, binge consumption prevalence in these two countries correlated to the number of outlets located within residential areas (Ahern, Margerison-Zilko, Hubbard, & Galea, 2013);(Livingston, 2008);(CDC, 2017).

As mentioned above, the correlation to the number of outlets; in this case, the range of six to fifty providers/sellers within 500meters (*0.310miles*) radius in all the researched areas was not only closely related to binge consumption patterns, but it also gave rise to multifaceted issues related to alcohol use. Some of the multifaceted issues were based on dual substances use and harmful consumption that were prevalent among youth in researched areas. The findings from chapter seven revealed the fact that youths who consume at a harmful level in this study were engaging in at least two or three forms of risky behaviours. Associated risk behaviours such as unintentional injuries, sexually transmitted diseases, alcohol dependence and other substance use were 29 times more likely to occur among the youth who consumed at harmful levels. A similar relationship was also mentioned by several local researchers (Liew et al., 2011);(Lee et al., 2006). For example, Manickam reported at least two to three comorbidities among young alcohol users, whereby, MIROS said harmful consumption patterns correlated to a high number of

accidental cases at public hospitals in Kuala Lumpur, Malaysia (Manickam et al., 2014)(MIROS, 2012). Thus, these form of comorbidities within young consumers impacts not only the youth themselves but the community as a whole (CDC, 2015);(Manickam et al., 2014);(Miller et al., 2007);(Chaloupka & Wechsler, 1996);(Swahn, Simon, Hammig, & Guerrero, 2004);(Serdula, Brewer, Gillespie, Denny, & Mokdad, 2004);(Chen, Gruenewald, & Remer, 2009);(Harrison, Fulkerson, & Park, 2000);(Popova, Giesbrecht, Bekmuradov, & Patra, 2009);(Anderson, Chisholm, & Fuhr, 2009);(Campbell et al., 2009);(Theall et al., 2009).

Therefore, the first objective of this study confirms the fact that high density of alcohol supply in researched areas are worrying factors that have a direct impact on youth from Chinese and Indian ethnic groups. The number of on and off-premise retail outlets which are easily accessible in researched areas may impact the health and social outcomes of those who consume alcohol at a riskier level. Such accessibility and availability issues are directly linked to the fact that there are no stringent policies in place to control neither supply nor demand within the local context. A similar need to address policy implications was also raised in other regional studies (Assuntha, 2001);(Mohd et al., 2015);(Jernigan & Indran, 1997);(Kortteinen, 2008);(Maniam, 1994).

In addition to the accessibility and availability of service providers surplus, there is also a concern that bottles/cans that contain ethanol are placed on open racks and sales of such products 24 hours a day in 33% of the outlets observed in this study. Once again, emphasizing the need to ensure strict guidelines for stores selling or servicing alcohol after hours. Issues about the restriction on hours of alcohol sales were also reviewed in 10 studies that support the notion that alcohol-related harm increases with every hour of sale in areas where people live and interact (Hahn et al., 2010).

However, a quick fixer like applying strict provisional laws or limiting the access of alcohol sales or production is not as simple as one would imagine. For instance, the review findings from fifty-nine studies concluded that it is difficult to prove the causal link or causal direction on the dentistry and hours of alcohol sales. Thus, this matter is still debatable (Popova et al., 2009). There is a need to take several issues into considerations that are dependent on other ecological influences, especially in a constantly evolving environment that accents community-level interventions (Chen et al., 2009);(Anderson et al., 2009);(Musick et al., 2008);(Heather & Stockwell, 2004). This is a crucial issue for consideration especially for Malaysia, where general perception on the imposed social sanction that restricts alcohol use among the Malay-Muslims, clearly impacted the number of outlets in Malay populated area. Thus, the widespread

belief of abstinence is the best policy that could be imposed without documented evidence that may lead to other forms of harms (*such as illegal supply and demand or binge consumption that is noted among Malay's in this and other local studies*) observed in majority Muslim countries (Al-Ansari, Thow, Day, & Conigrave, 2016);(Arfken, 2016);(Fadzli & Amer, 2014). Therefore, issues relating to value and control-oriented approach, need to be grounded in evidence and knowledge that provides an opportunity to engage the community as a whole. The required recommendations that reflect the theory of triadic influence, especially in regard to the environmental stream issues in figure 10, will be further deliberated in the following chapter of this study.

In conclusion, there is a need to curb the accessibility and availability of alcohol outlets within respective researched areas. The government along with individual communities need to promote and apply stringent public health policies that are based on an evidence-based approach. One of the suggested strategies would be on managing structural conditions that limit and restrict alcohol sales within respective communities. However, it is also important to recognize that environmental factors are not the only determinant factor that influences youth consumption patterns. Issues on parental and peer consumption patterns are equally relevant determinants that require consideration (Singh, et al., 2017);(Duncan et al., 2011);(Henry et al., 2005a);(Patock-Peckham, King, Morgan-Lopez, Ulloa, & Moses, 2011);(Yeh, 2006).

Interpersonal influences

The second objective of the study was to access normative controls of family and peers on youth consumption practices. The study's findings confirm the fact that the influence of an immediate family member who consumes alcohol was more significant than peer influence (Singh, et al., 2017);(Singh, et al., 2017). A similar causal relationship was also observed in other studies from Asia (Rüütel et al., 2014), Europe (Kask, Markina, & Podana, 2013) and Taiwan (Yeh, 2006). However, it is important to note that 62% of youths who were binge consumers reported that their peers were also consuming alcohol at a higher level. Similar peer association factors were also observed in a Lebanon study, which was based on university students who revealed the fact that peer opinion and behaviors were closely associated to unhealthy consumption patterns (Barbour et al., 2013). Nevertheless, harmful consumption patterns were six times greater among those who had both a family member and a peer who consumed alcohol. This kind of consumption patterns was prominent among the Chinese and Indian ethnic groups rather than the Malays. As contended by local studies, the low prevalence of alcohol consumption among the Malay ethnic group is dependent on the fact that the Islamic religion acts as a protective factor (Mohd et al., 2015);(Fadzli &

Amer, 2014). This form of ideological belief was also addressed in the environmental stream. The Malay's Islamic religiosity is a high protective factor that promotes abstinence (Abu-Ras, Ahmed, & Arfken, 2010). However, belonging to a particular religion that prohibits the use of a substance that may cause harm to an individual is not always a protective factor. Malaysia introduced religious prohibition against smoking since 1996 and yet the prevalence of smoking is significantly higher among the Malay ethnic group (Anwar, 2013); (Fakhurrazi, 2013). For instance, the findings from chapter eight revealed the fact that Malay's had a high percentage of current smokers and they were equally the most abundant representative group amongst shisha users. Similarly, Lim and colleagues assessment of 2016 National Health and Morbidity Survey reported that smoking was higher among the Malay (55.9%, 95% CI 54.8–57.1) ethnic group (H. K. Lim et al., 2013). In another local cross-sectional study done with university students; found that interpersonal influences as a factor in tobacco use were prevalent among males with a family member who smoked (Al-Dubai et al., 2014). Therefore, issues stressing the need to address distal and proximal influences as illustrated in figure 10, are inevitable.

The interpersonal influence on youth consumption patterns and associated risk factors highlights the need to ensure preventive measures at community levels must consist of parental and peer to peer support component that acts as a positive mediator. This form of a sizeable interpersonal element was also documented in the early 1990's by Barton. Barton and collogues emphasised the fact there are overlapping protective and risk factors which impact youth development. Hence, the emphasis was made to move away from vertical preventive measures (Barton, Watkins, & Jarjoura, 1997). A similar approach was also echoed in a study that examined peer, sibling and parent modelling impact on youth alcohol use. The findings expressed the fact that a comprehensive preventive approach with collaboration from family and peers will help in reducing multiple risk factors among youth within a community (Ary, Tildesley, Hops, & Andrews, 1993). After a decade, multilevel modelling findings also emphasised the imperative need for an inclusive preventive measure that revolves around youth ecology (Mayberry, Espelage, & Koenig, 2009). These forms of inclusive preventive measures are extensions of youth’s intrapersonal characteristics that are directly related to self-determination and resilience which is needed in managing harmful consumption (Sale, Sambrano, Springer, & Turner, 2003);(Ungar, 2012);(Fergus & Zimmerman, 2005).

Intrapersonal influences

The third objective of the study was to access youth personal characteristics that may increase unhealthy alcohol consumption practices. Even though young male adults were four times more likely than their female counterparts to binge drink, consumption patterns were also noted among females. For instance, 36% of women in this study reported that they have consumed or are current consumers. A similar trend is also indicated at a global level, where evidence has echoed the fact that there is a need to better understand this growing phenomenon among females (Slade et al., 2016).

Nevertheless, binge consumption patterns among young males is a dominant factor that is noted even at a global level (Tse, 2011);(R. W. Wilsnack et al., 2000). In this study, harmful consumption patterns were higher among Indian (54%) and Chinese (39%) ethnic groups in comparison to Malays (8%). Even though there was only a small number of Malay youths who reported binge consumption in this study, the prevalence was 10 times higher than what is recorded at the national level (MOH, 2011). Similar concerns over elevated binge consumption patterns among Malay's is cautioned by other local studies in Malaysia (Mutalip, Naidu, Kamaruddin, Ab Hamid, et al., 2013). Nevertheless, most of the regional surveys have equally emphasised the existence of unhealthy consumption patterns among the Indians and Chinese ethnic groups (Wan et al., 2005);(IPH, 2008);(K. Y. Cheah, 2014).

These forms of binge consumption patterns are worrying for Malaysia, mainly when this study's results were twice as much compared to high school students from China who recorded binge consumption at 20% (Lu et al., 2015). However, this study's results are slightly lower when compared to the western nations. For example, binge consumption patterns of 69% were observed among youth aged >18 years in the US (Miller et al., 2007) and 41% among Australian youths (Lubman, Hides, Yucel, & Toumbourou, 2007). Nevertheless, the western world is reporting a declining trend in binge consumption patterns, whereby it is undoubtedly on the rise in Asia (Ahlstrom & Osterberg, 2004).

As stipulated in chapter seven, evidence has linked several risk factors associated with binge consumption. Risk factors such as unintentional injuries, unintended pregnancies, unplanned sex and violent behaviours are all negative consequences of binge drinking (Preedy, 2016). The youths who consumed heavily were 29 times (95% CI: 9.52-85.93) more likely to engage in at least four or more risky behaviours. These forms

of associated risk behaviours were significantly high compared to Liew's study on university students in Malaysia. For example, in this study, 61% of youth drove a vehicle under the influence, compared to 18% in Liew's study. Even the number of smokers was slightly higher (85%) in this study, compared to Liew's findings at 82% (Liew et al., 2011).

In summary, this study's findings and most of the local evidence presented in Table 22; echoes the fact that harmful alcohol consumption patterns among local youths is alarming and there is an urgent need to adopt a holistic preventive approach that centres around the communities in which our youth reside (Lasimbang et al., 2017);(Wan et al., 2005);(Assuntha, 2001);(Fadzli & Amer, 2014);(Mohd et al., 2015). Similarly, global evidence have also concurred to the fact that the community-based interventions are imperative to address substance use and risk-taking behaviours among youths (Babor, 2010);(Wandersman & Paul, 2003);(Holder et al., 2000);(Foxcroft, Ireland, Lister-Sharp, Lowe, & Breen, 2003);(Hawkins, Catalano, & Arthur, 2002).

This study finding concludes the fact that risky behaviours were dominant among local youth who were binge consumers. These forms of risk-taking behaviours were prominent among youths within the six studied areas. Thus, this emphasises the need to apply a holistic preventive approach that revolves around youth's ecology. As discussed in this chapter, youth ecology that revolves around their environmental, interpersonal, and intrapersonal influences are all critical levels of causation. As summarized in table 13, the levels of caution which reflect ultimate, distal and proximal predictors, must be taken into consideration when interventions are being developed.

These triadic levels of causation, will help address not only issues pertaining to binge consumption among youths in the studied areas, but will also promote awareness of managing any form of risk-taking behaviours which are present in a youth's developmental stages (CDC, 2012);(Lämmle, Woll, Mensink, & Bös, 2013).

The following chapter will expand and recommend possible interventions that are suitable for the local context. The final chapter in this study will also address some of the limitations and provide insights into potential areas to be researched in the future.

Table 20: An overview of the TTI framework, that specifically addresses key aspects of youth alcohol use within the Malaysian context.

Levels of causation						
		Sociocultural environmental factors		*Interpersonal factors:*		*Intrapersonal factors:*
Study Objective		*to access the influences of environmental factors that may be affected by the residential make-up or belonging to a certain ethnic group*		*to access associated risk factors on alcohol use and its influences observed from family and peers consumption patterns*		*to access the intrapersonal factors associated risk, in relation to alcohol use*
Ultimate underlying causes	*Community and neighborhood cohesion and how this impacts the accessibility and availability*	A range of 6-50 providers/sellers within 500 meters or 1-kilometre radius in researched areas	*Family cultural communication and how this enhance the protective family resources for different ethnic groups*	50% of youth knew a friend who consumed alcohol and 45% knew of a family member who consumed alcohol	*Cognitive structures: self control or self esteem and how this impacts risk taking behaviors*	Male were four times more likely than females to binge drink. However, 36% of females in this study reported that they have consumed or are current consumers.
Distal Predisposing influences		Ethnic group influences: more provider/sellers in Chinese's (0.9-10.9/100m radius) and Indian (0.5-97/100m radius) populated areas		Riskier consumption patterns were 6 times greater among those who had both a family member and a peer who consumed alcohol. This form of riskier consumption patterns was prominent among Chinese and Indian ethnic group; rather than the Malay group.		Alcohol and tobacco use was prominent among binge consumers; with Malay youth reported a high prevalence of tobacco use.
Proximal Immediate Predictors		More providers/sellers correlated with heavier consumption patterns among Chinese's and Indians youth - who also practised high-risk behaviour		Youth with family influences in drinking were 3 times more likely to be associated with binge drinking.		Youth who were ever and current consumers were 7 times more likely to engage in 2 to 3 risk behaviours.
		Comorbidities which may have a direct or indirect impact on communities was evident among youth who were current consumer and among those who consumed at a riskier level		Family consumption patterns exert more effect on youth behaviours, rather than peer's consumption behaviours. Thus, family norms around alcohol use may have a positive or negative impact on youth's alcohol use or misuse		Youth who were binge consumers were 29 times more likely to engage in 4 or more risky behaviour; hence, emphasizing acute use with direct implication on physical and mental health

CHAPTER TEN: CONCLUSIONS AND RECOMMENDATIONS

10.1 Conclusions

In conclusion, binge consumption amongst Malaysian youths is on the rise, and these forms of problematic consumption patterns are firmly related to several other risk-taking behaviours. Therefore, the respective stakeholder, i.e. government or non-government agencies need not only be vigilant on issues about alcohol and its impact on the community as a whole but needs to ensure that local evidence and reports are used to develop interventions that address the underlying traits of a youth's ecology.

Strength in evidence compiled by Griffin and Botvin indicates that most effective interventions are based on a multifaceted approach that addresses the salient and protective factors of individuals, families and communities (K. W. Griffin & Botvin, 2010). Therefore, the application of universal prevention strategies that also emphasise upstream and downstream solutions is recommended. These types of solutions will engage communities at grass root levels and help address issues about substance use amongst the youth (Johnson et al., 2007);(Wandersman & Paul, 2003). Active community engagement is also being emphasised by the local government. This timely effort is primarily aimed at tackling the growing health burden of non-communicable diseases on the Malaysian healthcare system (Mustapha et al., 2014). An example of this effort is noted through the local government initiative in piloting Enhanced Primary Healthcare approach at primary care centres that aim to advocate community engagement with targeted services by family health teams ("Pilot project on EnPHC to be implemented in July - Dr Subramaniam | Astro Awani," n.d.);(MAJID, 2017). These forms of strategies will not only benefit the youth at an individual level but will also help reduce health risks in communities by introducing positive around the youth's ecology. Protective factors can be enforced by enriching a family's knowledge base, capacity, and tools. This may not improve the overall wellbeing of a family but will have a positive impact on health issues of the community as a whole (Spoth, Greenberg, & Turrisi, 2008);(Wandersman & Paul, 2003);(Hawkins et al., 2002).

The following Table 23 provides an overview of the suggested recommendations which targets preventive measures for individuals at a social and environmental level. The proposed recommendations are essential, especially in predominantly Muslim populations, where abstinence ideologies may dominate evidence-based preventive measures (Arfken, 2016);(Al-Ansari et al., 2016);(Ghandour et al., 2016).

Table 21: An overview of recommendations based on TTI framework that specifically addresses key aspects of youth alcohol use within Malaysian context

Levels of causation					
Interventions	*Community and neighbourhood cohesion and how this impacts the accessibility and availability*	*Sociocultural environmental factors*	*Family cultural communication and how this enhance the protective family resources for different ethnic groups*	*Interpersonal factors:*	*Cognitive structures; self control or self esteem and how this impacts risk taking behaviours*	*Intrapersonal factors:*
		advocate and empower community engagements in managing structural implications on youth behaviours		*to access associated risk factors on alcohol use and its influences observed from family and peers consumption patterns*		*streamlining individual skills to manage initiation, current use and binge consumption patterns to prevent and/or delay the use of substances.*
Ultimate underlying causes		Empower community and build their capacity to operate as a full spectrum of preventive measure; thus, state local authority to actively engage local communities in endorsing the number of outlets that are allowed to sell/serve alcohol within their residential makeup - evidence indicate not more than 8 vicinities in 1-kilometre radius		Family oriented value system; that promotes active engagement in parent and child relationship. Hence, empower parents with knowledge and tools that can help promote bonding and control mechanism that evolves with child developmental cycle		Gender and ethnic group association were high predictors of binge consumption and risk-taking behaviours. Thus, engage youth in a positive learning environment that promotes effective and efficient thinking ability.
Distal Predisposing influences		Disseminate evidence that highlights prevailing cultural norms: provide cultural context information that targets tolerant or permissive attitude towards certain ethnic group alcohol use.		Different risks, as well as protective family factors, are common in certain ethnic groups; thus, use evidence to guide targeted ethnic group prevention strategies. Ex: For Chinese and Indian ethnic groups - address consumption patterns of family members. Whereby, for Malay ethnic group address consumptions patterns of peers and its influence on youth drinking patterns.		Enhance psychosocial skills by also addressing misconception of potential risk associated with alcohol or other substance use
Proximal Immediate Predictors		Acknowledge the fact that service providers/seller are all part of the prevention enforcer; hence, promote responsible providers and sellers by empowering more on site licensed premises to have trained staff who act as community enforcers on deflecting underage and binge drinking.		Promote cognitive problem-solving interventions that also address family and peers mediators that address the positive and risk factors on youth consumption patterns.		Promote resiliency research that illuminates the concept of "risk factors," "protective factors," and "healthy youth development strategies", by defining each of these concepts adequately.
		Promote more community-based centres (Supported by KOSPEN in Malaysia) that act as health promoters and counsellors (comprising of community members of all ages in collaboration with healthcare providers) who provide preventive measures on risk-taking behaviours that also addresses substance use patterns among youth		***Similar approach suggested for the environmental stream: Promote more community-based centres to use evidence to guide strategies on how to manage risk-taking behaviours among youth - especially targeting the fact that parental consumption patterns are dominant among Chinese and Indians. Whereby friends drinking behaviours is key determinant among Malay youths.the fact that parental consumption patterns are dominant among Chiense and Indians. Whereby friends driking behvaiours is key detrminant among Malay youths.***		Enhance services that recognize psychosocial treatment approaches that foster minimization approach

10.2 Recommendations

Each of the recommendations suggested in table 14, impacts the youths' ecology as a whole. These strategies are linked to neighbourhoods where youths reside, and these factors will have a direct effect on their health and general wellbeing (Browning, Soller, & Jackson, 2015; Leventhal & Brooks-Gunn, 2000). Therefore, the recommendations mentioned below are not only to shed light on substance abuse among the youth, but also to help address several risk behaviours that may linger into adulthood.

10.2.1 Sociocultural environmental level

The first recommendation suggested is aimed to establish long-term efforts that will benefit the community on an environmental level. As mentioned above, this strategy is in line with the local government plan to engage communities as advocates promoting wellbeing among residents within their respective neighbourhood. *KOSPEN*[18] is a part of the *Enhanced Primary Health Care (EnPHC)* program in Malaysia. It is a strategy implemented by MOH to actively engage community members as volunteers to promote healthy living among its population. These volunteers could also be the voice of their communities who effectively manage the accessibilities and availability of alcohol and tobacco within the premises of their neighbourhood. For example, communities within each of the studied areas could efficiently advocate limiting 8 premises that are licensed to sell/serve alcohol and cigarettes within a 1-kilometre radius.

However, caution is bestowed to ensure that the community members who act as advocates on this matter have sufficient evidence and capacity to be effective community advocates. This was also stressed by Johnson and colleagues, as they have outlined several methods of mobilizing community engagement as primary advocates on issues about substance use among young adults (Johnson et al., 2007).

It is important to note that alcohol sellers or service providers can also act as prevention enforcers. Empowering these providers and sellers by training their staff to work as community enforcers will help deflect underage and binge drinking (Komro & Toomey, 2002);(Biglan et al., 1996).

The second strategy aims at disseminating evidence that highlights prevailing cultural norms that target tolerant or permissive attitudes toward a particular ethnic group's alcohol use. For instance, it's a

[18] Komuniti Sihat Perkasa Negara (KOSPEN), is the transformation of public health services to improve the health of Malaysians. The implementation is based on volunteers (GSiM) from the community to act as an agent to mobilize society towards healthy lifestyles and prevent noncommunicable diseases. http://pkdgombak.moh.gov.my/index.php/en/public/komuniti-sihat-perkasa-negara-kospen

conditioned cultural norm for the Chinese ethnic group to consume alcohol at any festive event (Cook, Mulia, & Karriker-Jaffe, 2012);(Jiang, 2011);(Cheah, 2014). Similar norms were noted among the Indian ethnic group, where binge drinking patterns are significantly higher (Cochrane & Bal, 1990; Singh, et al., 2017);(Hughes et al., 1990). Thus, there is a need to incorporate culturally sensitive prevention and treatment strategies (Steinka-Fry et al., 2017);(Khan, Cleland, Scheidell, & Berger, 2014);(Cook et al., 2012).

Finally, there is a need to promote more community-based centres (*Supported by KOSPEN in Malaysia*) that are equipped with health promoters and counsellors (*comprising of community members of all ages in collaboration with healthcare providers*) who provide preventive measures on risk-taking behaviours while addressing substance use patterns among the youth.

10.2.2 Interpersonal level

Family consumption patterns had a significant impact on youth drinking behaviours within this study's context. Therefore, one of the suggested recommendations is to ensure that family members are equipped with the required skills and knowledge to recognise harmful alcohol consumption among youth. In addition to learning, there is also evidence from this study's review chapter that highlights the fact that parental consumption patterns were closely associated with problematic behaviours among youths. Therefore, parental values, along with bonding, monitoring and active engagement in a child's life will undoubtedly promote protective behaviours among youths. Hence, empowering parents with knowledge, skills, and tools on how to encourage positive factors that revolves around a child's developmental cycle is an important prevention strategy (Moretti and Peled 2004);(Mistry et al., 2012). This form of preventive approach is also driven by evidence which emphasises on improving parental monitoring and positive relationship factors that will help reduce multiple clusters of risk-taking behaviours (Terziah, Andrews, & Moore, 2011). Evidence highlighted in the review also reflects the need for constant positive reinforcement messaging to be present in a child's evolving ecology and development.

As mentioned in the environmental level of recommendations, there is a need to address different risks as well as establish protective family factors. The use of evidence to guide targeted ethnic group prevention strategies is imperative. For instance, this study's findings indicate that alcohol use was a prominent influencer within families of Chinese and Indian ethnic groups. Whereas, for Malays, tobacco use within peers was a leading factor. Thus, there is also a need to implement a peer to peer prevention strategies as

part of the community's prevention programme. Peer to peer education programme is not a new concept in Malaysia. For instance, the "PROSTAR[19]" programme was introduced in the 1990's and the "Young Doctor Programme[20]" was introduced in 2007, but they have shown a limited success so far (Dahlui et al., 2015). The limitations of such programmes could be due to a lack of systematic evaluations. They are also introduced in isolation and not as a part of a harmonised mechanism, which inevitably is not sustainable over time (Denny, 2004);(Webel, Okonsky, Trompeta, & Holzemer, 2010);(Simoni, Franks, Lehavot, & Yard, 2011).

At the interpersonal level, there is a need to enhance the parents' skills and knowledge as well as equip them with tools that help promote a child's ability to reinforce positive factors. Once again, emphasizing the need for an integrated harmonised approach that includes parents and peers as advocates for preventive strategies.

10.2.3 Intrapersonal level

Finally, this study has emphasised the need to streamline individual youth skills to manage initiation, current use and binge consumption patterns. For instance, men belonging to the Indian ethnic group was a high predictor of binge consumption and risk-taking behaviours. Nevertheless, current and binge drinking patterns were also noted among females and youths from Chinese and Malays ethnic groups. Hence, there is a need to engage youths from all three ethnic groups. This form of engagement creates a positive learning environment which will help promote effective and efficient thinking abilities to manage certain forms of risk that they may be exposed to (Sussman, 2013);(Bourque et al., 2016). Such a learning environment is essential especially when local studies have documented evidence indicating that the Malaysian students' critical thinking skills may be relatively low (Kuldas, Hashim, & Ismail, 2015);(Chan, Sidhu, Lim, & Wee, 2016);(Mohd et al., 2015). Also, enhancing knowledge is also crucial in improving psychosocial skills. This is done by clearing up misconceptions about potential risks associated with alcohol or other substance use (Hum et al., 2016). Therefore, addressing the resiliency component will illuminate the concept of "risk

[19] PROSTAR stands for "Healthy Program Without AIDS for Adolescents". This program was introduced by MOH in addressing HIV / AIDS problems among adolescents. The idea of setting up PROSTAR was triggered in 1995 as a result of the MKM's talks with various government and non-government agencies. http://kesihatan-awam.blogspot.my/2009/04/prostar.html

[20] Doctor Young is a school based programme for year 4, 5 and 6 students. These students are selected and trained as a Peer Mentor, who acted as a catalyst for change in knowledge, attitude and practice of positive health among school students. http://healthinfortoday.blogspot.my/2012/04/young-doctors-club.html

factors," "protective factors," and "healthy youth development strategies", all of which are very much needed within our communities (Azmawati et al., 2015).

In summary, at the intrapersonal level, there is a need to develop an intervention approach that builds youths' skills, learning abilities, and resilience.

10.3 Future Research Focus

As mentioned in the recommendations section, Malaysia needs to apply integrated preventive approaches that will help reduce risk-taking behaviours. The need for preventive measures and establishment of protective factors have been echoed by local researchers since the early 2000's (Hamzah, 2007);(Dahlui et al., 2015);(Kuldas et al., 2015);(Farid, Rus, Dahlui, Al-Sadat, & Aziz, 2014).

Firstly, an evaluation process needs to be integrated at a national, state and district level to assess the quality and impact of current preventive strategies that revolve around a youth's wellbeing. This is documented and handled by trusted governmental agencies within the Malaysian 11th Plan[21]. However, there are various barriers and challenges associated with ongoing issues about the quality of national programmes within the local context (Chie et al., 2015);(Thomas, Beh, & Nordin, 2011);(Hum et al., 2016).

Therefore, a rapid assessment of the primary preventive measures on risks and protective factors for the youth within specific state/district/community is needed. This quick assessment process will help identify current programmes and interventions which addresses youths at risk. This mechanism will act as an audit to determine what forms of threats and what protective factors are in place within communities. It will also point out who is doing what and how. Based on this information, the community can identify and mobilise relevant stakeholders who will act as community advocates. The community advocates need to isolate critical issues that they would like to focus on and figure out how they would want to move forward. A similar preventive approach was adopted by community advocates in the state of Victory, Australia (Royal Children's Hospital, 2012). This guide was developed in collaboration with researchers from the academic institutes who ensured the fact that the guide was based on evidence that took into consideration the ecological issues revolving a child's life cycle.

[21]The **Eleventh Plan** will be premised on the **Malaysian** National Development Strategy that will focus on rapidly delivering high impact outcomes to both the capital economy and people economy at affordable cost. http://www.epu.gov.my/en/rmk/eleventh-malaysia-plan-2016-2020

Also, at the secondary prevention level, there is also an opportunity to test out the Substance Abuse and Mental Health Service Administration (SHAMSHA) tool – that promotes the use of Substance Abuse Prevention Planning Epidemiology Tool (SAPPET). This tool could be tested and used for specific culturally sensitive issues in states with a high prevalence of substance use.

10.4 Study Limitations

The study limitations are mentioned in the chapters of this study, which are written as part of the manuscripts, or they have been published.

However, there is a need to emphasise the fact that the small scale of this study only illustrates the youth patterns within specific studied areas in Klang Valley, Malaysia. Also, the sampled number of youths in each ethnic group was almost the same. This was done to ensure a fair racial representation. However, it is important to note that the general ethnic group make up in Malaysia is 67% Malays, 25% Chinese and 7% Indians, followed by others. The study also points out the due recognition on retrospect measure of family wealth would have been useful. Finally, the potential for under-reporting on alcohol consumption patterns is cautioned since this is a socially sanctioned issue in Malaysia.

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Appendix 1

Ethical approval was obtained from Perdana University Institutional Review Board [PUIRBHR0081 and PUIRBHR0083] and Monash University Human Research Ethics Committee in Malaysia [CF/14/3510-2014001851 & CF/16/762-2016000369]. Written consent was sought and granted from participants explicitly via consent forms prior to participating in the study.

PERDANA UNIVERSITY (KPT/JPT/DFTIUS/831)

28 May 2015

Sangeeta Kaur
[redacted]

Dear Sangeeta Kaur,

APPROVAL OF PROTOCOL

On 28 May 2015 the IRB reviewed the following protocol:

Type of Review:	Initial Review
Title:	Exploration of Family and Social Influences on Alcohol Consumption Within Three Ethnicities in Malaysia
Investigator:	Sangeeta Kaur
IRB ID:	PU IRBHR0081
Funding:	-
Grant Title:	-
Grant ID:	
IND, IDE or HDE:	-
Documents Reviewed:	Application for Initial Review Form, Protocol, Consent Form, Questionnaires, Ethics approval letter from UMMC and Training Evidence.

The IRB approved the protocol from 28 May 2015 to 27 May 2016 inclusive. Before 27 May 2016, or within 30 days of study close, whichever is earlier, you are to submit a completed "FORM: Continuing Review Progress Report (IIRP-212)" and required attachments to request continuing approval or closure.

If continuing review approval is not granted before the expiration date of 27 May 2016 approval of this protocol expires on that date.

In conducting this protocol you are required to follow the requirements listed in the INVESTIGATOR MANUAL (HRP-103).

Sincerely,
[redacted]
Assoc. Prof. Dr. Kafen Morgan
Chairman
PU-Institutional Review Board

[redacted]

PERDANA UNIVERSITY *(KPT/JPT/DFT/US/B31)*

11 June 2015

Sangeeta Kaur, Anusha Devi, Loo Enzhong and Ganesh A/l Subramaniam
PU-Royal College of Surgeon in Ireland (PURCSI)
[redacted]

Dear Sangeeta Kaur, Anusha Devi, Loo Enzhong and Ganesh A/l Subramaniam,

APPROVAL OF PROTOCOL

On 11 June 2015 the IRB reviewed the following protocol:

Type of Review:	Initial Review
Title:	Millennials & Shisha Amongst Malaysian Youth: Whats the Public Health Implication
Investigator:	Sangeeta Kaur, Anusha Devi, Loo Enzhong and Ganesh A/l Subramaniam
IRB ID:	PU IRBHR0083
Funding:	-
Grant Title:	-
Grant ID:	-
IND, IDE or HDR:	-
Documents Reviewed:	Application for Initial Review Form, Protocol, Consent Form, Questionnaires, and Training Evidence.

The IRB approved the protocol from 11 June 2015 to 10 June 2016 inclusive. Before 10 June 2016, or within 30 days of study close, whichever is earlier, you are to submit a completed "FORM: Continuing Review Progress Report (HRP-212)" and required attachments to request continuing approval or closure.

If continuing review approval is not granted before the expiration date of 10 June 2016 approval of this protocol expires on that date.

In conducting this protocol you are required to follow the requirements listed in the INVESTIGATOR MANUAL (HRP-103).

Sincerely,

[redacted]

Assoc. Prof. Dr. Karen Morgan
Chairman
PU-Institutional Review Board

[redacted]

MONASH University

Monash University Human Research Ethics Committee (MUHREC)
Research Office

Human Ethics Certificate of Approval

This is to certify that the project below was considered by the Monash University Human Research Ethics Committee. The Committee was satisfied that the proposal meets the requirements of the *National Statement on Ethical Conduct in Human Research* and has granted approval.

Project Number:	CF14/3510 - 2014001851
Project Title:	Exploration of family and social influences on alcohol consumption within three ethnicities in Malaysia
Chief Investigator:	Prof Daniel Reidpath
Approved:	From: 9 December 2014 To: 9 December 2019

Terms of approval - Failure to comply with the terms below is in breach of your approval and the Australian Code for the Responsible Conduct of Research.

1. The Chief investigator is responsible for ensuring that permission letters are obtained, if relevant, before any data collection can occur at the specified organisation.
2. Approval is only valid whilst you hold a position at Monash University.
3. It is the responsibility of the Chief Investigator to ensure that all investigators are aware of the terms of approval and to ensure the project is conducted as approved by MUHREC.
4. You should notify MUHREC immediately of any serious or unexpected adverse effects on participants or unforeseen events affecting the ethical acceptability of the project.
5. The Explanatory Statement must be on Monash University letterhead and the Monash University complaints clause must include your project number.
6. **Amendments to the approved project (including changes in personnel):** Require the submission of a Request for Amendment form to MUHREC and must not begin without written approval from MUHREC. Substantial variations may require a new application.
7. **Future correspondence:** Please quote the project number and project title above in any further correspondence.
8. **Annual reports:** Continued approval of this project is dependent on the submission of an Annual Report. This is determined by the date of your letter of approval.
9. **Final report:** A Final Report should be provided at the conclusion of the project. MUHREC should be notified if the project is discontinued before the expected date of completion.
10. **Monitoring:** Projects may be subject to an audit or any other form of monitoring by MUHREC at any time.
11. **Retention and storage of data:** The Chief Investigator is responsible for the storage and retention of original data pertaining to a project for a minimum period of five years.

[redacted]

Professor Nip Thomson
Chair, MUHREC

cc: Prof Pascale Allotey, Ms Sangeeta Singh

[redacted]

MONASH University

Monash University Human Research Ethics Committee (MUHREC)
Research Office

Human Ethics Certificate of Approval

This is to certify that the project below was considered by the Chair of the Monash University Human Research Ethics Committee. The Chair was satisfied that the proposal meets the requirements of the *National Statement on Ethical Conduct in Human Research* and has granted approval.

Project Number:	**CF16/762 - 2016000369**	
Project Title:	**Millenials and the use of shisha amongst Malaysian youth: what's the public health implication?**	
Chief Investigator:	**Prof Daniel Reidpath**	
Approved:	**From: 21 March 2016**	**To: 21 March 2021**

Terms of approval - ***Failure to comply with the terms below is in breach of your approval and the Australian Code for the Responsible Conduct of Research.***

1. Please note that MUHREC approval is only for the use of the existing data and does not cover the collection of new data.
2. Approval is only valid whilst you hold a position at Monash University and approval at the primary HREC is current.
3. **Future correspondence:** Please quote the project number and project title above in any further correspondence.
4. **Final report:** A Final Report should be provided at the conclusion of the project. MUHREC should be notified if the project is discontinued before the expected date of completion.
5. **Retention and storage of data:** The Chief Investigator is responsible for the storage and retention of original data pertaining to a project for a minimum period of five years.

[redacted]

Professor Nip Thomson
Chair, MUHREC

cc: **Ms Sangeeta Kaur**

Human Ethics Office
Monash University
[redacted]
ABN 12 377 614 012 CRICOS Provider #00008C

Appendix 2

Cohen's tool was used to document vicinities placement of alcohol and promotional adverts of alcoholic beverages in outlets within respective research sites (Cohen et al., 2007). This tool was adapted, and the simplicity was ensured so that the vicinities representatives were not overly concerned with the information that was being documented. In addition, there is also an excel presented here that also emphasise the sample size in selected research sites.

Alcohol Geo Mapping Survey

Page One

1. What time were you at this vicinity?
   Record the time you spent observing this vicinity: from what time to what time

2. Name of location
   Which site are you at? is it Ampang, Batu, Cheras, Sentul, Petaling Jaya, Setapak: also indicate what is the street name

3. How many alcohol adds have you observe around the vicinity
Refers to visible display of marketing adds- such as posters, banner, sign boards, shop sign, etc

4. Location *
Refers to what form of locality is this- look at following options; if its only one block vicinity then place it under normal shop lot area- but if it's a huge metropolitan area then choose option one

Main metropolitan area

In a food and beverage vicinity

Normal shop lot area (only one block)

Other

5. Type of store *

Grocery (normal sundry shop)
Supermarket (carefour, giant, aeon, etc)
KMart
Cafe
Bar/Pub
Other

6. Opening Hours *

- [ ] 10am - 10pm
- [ ] 9am - 9pm
- [ ] 8am-8pm
- [ ] 10am-6pm
- [ ] Other

7. How many stores or service providers were observed at this locality *

Walk around and note how many service stores/providers are serving or selling alcohol

8. Placement of alcohol*

Row 1	On the shelf (non-refrigerated) In refrigerator/cooler Floor display Behind the cash register On a shelf next to beverages On a shelf next to food items Other placement

9. What type of alcohol*

Note where is alcohol placed: pls also check local sundry shop or huge supermarket chains such as Carrefour, aeon, giant- most of these supermarkets are selling alcohol but it is kept behind in shelves

- [ ] Beer
- [ ] Liquor (Whisky, Rum, Brandy, Vodka, etc)
- [ ] Other-required *

10. Pricing *

Observe pricing range- for instance beer is sold within the price range of RM2 to RM5 ringgit per can.

Beer

Liquor

Other

11. Main ethnicity observed*

Even though the area is selected for respective ethnicity group but please record your observation- meaning what are main ethnicity group that you are observing

Malay
Indian
Chinese
Other

12. Projected age of customer/client

- [ ] 12-18
- [ ] 19-25
- [ ] 26-31
- [ ] 32-37
- [ ] 37 and above
- [ ] Other

sentation amounting to/above 10,000 is considered urban area and any amount/below 5000 is considered semi urban area.

xcal government area comprising the urban area as a whole and its primary commuter areas, typically formed around a city with a large concentration of people

No Appendix: 2

No	District	Identified area	Population size (based on 2010 census)	Youth estimates 17% of the total population	No of 7 eleven sites were used to identify number of metropolitan sites in a district	Educational Sites (within 5 km radius)	Major Township	Population breakdown	Ethnicity	Classification as Urban (10,000) or Semi Urban (<5000)
	Kuala Lumpur, Districts									
1	*Setapak*	*293,280*		*Approximately 152,505 Malay residing in setapak. 17% of youth (age 15-29) est = 25,925. Within each age range 25,925/14= 1,825. 18-25 are est at 14,816. 10 metropolitan sites identified {14,816/10= 1,482 youths at respective metro sites}. 3 metro sites were selected, hence sample size for Malay youth 4,446*	*Setapak 4 & Wangsa Maju 6=10*	(i)Dasein - Academy of Art. An industry driven Design and Art College, (ii)Open University-Sri Rampai Learning Centre, (iii)TAR University College, (iv)Nursing college and (v)Kuala Lumpur Metropolitan University College (KLMUC).	Setapak is the township of Wangsa Maju. Wangsa Maju has since become a major residential area for the students, due to the locality of Tunku Abdul Rahman University College (TARC) & Universiti Tunku Abdul Rahman (UTAR)	Racial composition: Malay: 52.45% Chinese: 39.76% Indian: 7.05% Others: 0.74%	*Malay*	*Urban*
2	*Cheras*	*12,194 (< among all others cause semi urban site are below 5,000 marker)*	*Approximately 1,219 (semi urban.5000) Malay residents in Cheras. 17% youth (age 15-29) est = 207. Within each age range 207/14= 15. Hence, 18-25 are est = 120 youth at @ Metropolitan sites {120/12= 10 youths at respective sites}. 3 metro sites we selected 3x10= 30 Malay youth sample size*	*12 in total in Taman Cheras*	Cheras is famous for its schools and institutions of higher learning. (i)UCSI University, (ii)Kolej Teknologi YPC-iTWEB, (iii)Cyberbernetics International College of Technology (CiCT), (iv)Institute Perguruan Ilmu Khas (Special Education Teachers' Institute) and (v)Institute Perguruan Teknik (Technical Teachers' Institute).	Longest pasar malam (night market) in Malaysia which is located in Taman Connaught. Taman Connaught Pasar Malam serves many of the residents here who come from all parts of Cheras as well as students in UCSI University who stay around here	Chinese: 84.14% Malay: 9.56% Indian: 6.16% Others: 0.14%	*Malay*	*Semi Urban*
			Approximately 4,910 Chinese (< among all others cause semi urban site are below 5,000 marker) and estimated no of youth(age 15-29) 4,949 all ethnicities. 17% youth age 15-29 =835/14=60. Hence, 18-25 age youth are 60x8=480 per site. 480/12 metropolitan sites= 40 youths at 3 respective metro sites= 120 Chince youth sample size					*Chinese*	*Semi Urban*
3	*Batu*	*321,165*	*Approximately 48,175 Indian and estimated no of youth(age 15-29) 17% (8,190). 8190/14 of youth age 15-29=585 youth in each age range. 18-25 =585x8=4,680 youth within the age range of 18-25. {4680/28= 167 youths at respective sites}. At 3 metro sites there were 167x3= 501 sample size of youth*	*28 in Batu and 5 in total with address indicating Sentul*	(i)Victoria International Private College, (ii)Uni Kebangsaan Msia, (iii) UUM, Kolej Tun Syed-2.7km, (iv) S.T.I College Malaysia and (v) My Dancesport Academy	Bandar Baru Sentul is a major township in Sentul.	Malay: 44.27% Chinese: 40.77% Indian: 14.33% (Tamil, Punjabi) Others: 0.63%	*Indian*	*Urban*
	Selangor Districts									

Appendix 3

Opinion and drunkenness Survey

OPINIONS ABOUT DRINKING AND DRUNKENNESS

Page One

1. Do you think there is sufficient enforcement on alcohol misuse in Malaysia?
   Misuse: refers to drunk driving, crime caused during intoxication, anti-social behaviour by those who are drunk

- [ ] Yes
- [ ] No
- [ ] Dont Know
- [ ] Refused
- [ ] Other-required _____ *

2. Did you know that Malaysia was ranked as the 10th highest consumer of alcohol in the world?

- [ ] Yes
- [ ] No
- [ ] Didn't Know
- [ ] Refused
- [ ] Other

3. How serious would you say this problem is in Malaysia? Would you say it is ...

- [ ] Most serious problem
- [ ] One of many problems
- [ ] Only minor problem
- [ ] Dont know

4. Do you agree or disagree with the statement that Malaysia has a “drinking problem”?

- Strongly Disagree
- Nor disagree or agree
- Strongly Agree
- Dont Know
- Refused

5. Do you think the alcohol consumption increases with accessibility?
Accessibility refers to areas or service providers or stores/places that sells alcohol

- Strongly Disagree
- Nor disagree or agree
- Strongly agree
- Dont Know
- Refused

6. Do you think the youth today is consuming alcohol?
Youth definition: 18-25 years old

- Strongly Disagree
- Nor disagree or agree
- Strongly agree
- Dont Know
- Refused

7. It's OK to get drunk, as long as it's not everyday

- Strongly Disagree
- Nor disagree or agree
- Strongly Agree
- Dont Know
- Refused

8. Talking honestly to friends whose drinking is getting out of hand is important for people to do

- Strongly Disagree
- Nor disagree or agree
- Strongly agree
- Dont Know
- Refused

9. Drunkenness is acceptable in some situations

- Strongly Disagree
- Nor disagree or agree
- Strongly agree
- Dont Know
- Refused

10. My friends and family would listen to me if I suggested they cut back on their drinking

- Strongly Disagree
- Nor disagree or agree
- Strongly agree
- Dont Know
- Refused

11. Do you think alcohol consumption is influenced by a parent who drinks?

- Strongly Disagree
- Nor disagree or agree
- Strongly agree
- Dont Know
- Refused

12. Do you think its important to talk to children about alcohol consumption? for instance what is alcohol and its risk?

Children refers to anyone who is above 10 and below 18

- ○ Strongly Disagree
- ○ Nor disagree or agree
- ○ Strongly agree
- ○ Dont Know
- ○ Refused

13. Have you ever spoken about alcohol consumption? for instance what is alcohol and its risk?

- ☐ Yes
- ☐ No
- ☐ Cant remember
- ☐ Dont Know
- ☐ Refused
- ☐ Other-required [ ] *

14. Have anyone spoken to you, about alcohol consumption? for instance what is alcohol and its risk?

- [ ] Yes
- [ ] No
- [ ] Cant remember
- [ ] Dont Know
- [ ] Refused
- [ ] Other-required *

15. Do you think alcohol consumption leads to risky behaviour; such as violence, crime, anti-social, etc

- ○ Strongly Disagree
- ○ Nor disagree or agree
- ○ Strongly agree
- ○ Dont Know
- ○ Refused

16. Where, if anywhere, do you personally believe it is acceptable to drink

At Home
Family home/relatives home
Friends house
Pub/Bar
Cafe/Restaurant
Dance/Night Club
Sports Club
At work
Out and about (park, street, mall, etc)
Other
Dont Know
Refused
No where- its not acceptable to drink

17. In your opinion, how old should someone be before they are allowed to drink at home, under the guidance of their parents or another responsible adult?

18. Similarly, in your opinion, how old should someone be before they are allowed to drink anywhere, without guidance of their parents or another responsible adult?

19. In your opinion what amount of drinks can a man consume-which is considered safe drinking?

Safe drinking refers to limit (number of drinks)

Drinks within the range of 1-2	Drinks within the range of 2-4	Drinks within the range of 4-6	Any amount beyond 6
○	○	○	○

20. In your opinion what amount of drinks can a woman consume-which is considered safe drinking?

Safe drinking refers to limit (number of drinks)

Drinks within the range of 1-2	Drinks within the range of 2-4	Drinks within the range of 4-6	Any amount beyond 6
○	○	○	○

Appendix 4

Self-Administered Survey

Identified youth:

Youth Risk Behavior Survey

This survey is about health behaviour. It has been developed so you can tell us what you do that may affect your health. The information you give can be used to improve health education for young people like yourself.

DO NOT write your name in this survey. The answers you give will be kept private. No one will know what you write. Answer the questions based on what you really do.

Completing the survey is voluntary. If you are not comfortable answering a question, just leave it blank.

The questions that ask about your background will be used only to describe the types of youths completing this survey. No names will ever be reported.

Make sure to read every question. When you are finished, follow the instructions of the person giving you the survey.

Thank you very much for your help.

Directions
Select the answer that suits you best.
If you need to change your answer, inform the person who has given you the survey, immediately so that changes can be recorded.

1. How old are you?

A. 18 years old ☐ B.19 years old ☐ C. 20 years old ☐

D. 21 years old ☐ E. 22 years old ☐ F. 23 years old ☐

G. 24 years old ☐ H. 25 years old ☐

2. What is your sex?

A. Female ☐ B. Male ☐ C. Other ☐

3. Are you a student?

A. Yes (if yes pls go to **3a** question)
B. No (if no pls go to **3b** question)
C. Other (pls specify)_____

3a. What is your current level of education?

A. Diploma B. Degree C. Master
D. Graduate Degree E. PhD F. Foundation Year
G. High School H. Other _____

3b. Are you employed?

A. Yes (if yes which filed_____)
B. No (if no – who is supporting you financially? _____)

4. Which ethnicity do you belong to?

A. Malay B. Chinese C. Indian
D. Others (pls specify_____)

The next 3 questions ask about safety.

5. During the past 30 days, how many times did you **ride** in a car or other vehicle **driven by someone who had been drinking alcohol**?

A. 0 times
B. 1 time
C. 2 or 3 times
D. 4 or 5 times
E. 6 or more times

6. During the past 30 days, how many times did you **drive** a car or other vehicle **when you had been drinking alcohol**?
   A. I did not drive a car or other vehicle during the past 30 days
   B. 0 times
   C. 1 time
   D. 2 or 3 times
   E. 4 or 5 times
   F. 6 or more times

The next 6 questions ask about violence-related behaviours.
*(**Rational**: Alcohol consumption and, in particular, binge-drinking increases the risk of being a victim of violence)*

7. During the past 12 months, how many times were you in a physical fight?
   A. 0 times
   B. 1 time
   C. 2 or 3 times
   D. 4 or 5 times
   E. 6 or 7 times
   F. 8 or 9 times
   G. 10 or 11 times
   H. 12 or more times

8. During the past 12 months, how many times were you in a physical fight in which you were injured and had to be treated by a doctor or nurse?
   A. 0 times
   B. 1 time
   C. 2 or 3 times
   D. 4 or 5 times
   E. 6 or more times

9. Have you ever been physically forced to have sexual intercourse when you did not want to?
   A. Yes B. No

10. During the past 12 months, how many times did someone you were dating or going out with physically hurt you on purpose? (Count such things as being hit, slammed into something, or injured with an object or weapon.)
   A. I did not date or go out with anyone during the past 12 months
   B. 0 times
   C. 1 time
   D. 2 or 3 times
   E. 4 or 5 times
   F. 6 or more times

11. During the past 12 months, how many times did someone you were dating or going out with force you to do sexual things that you did not want to do? (Count such things as kissing, touching, or being physically forced to have sexual intercourse.)
    A. I did not date or go out with anyone during the past 12 months
    B. 0 times
    C. 1 time
    D. 2 or 3 times
    E. 4 or 5 times
    F. 6 or more times

The next 6 questions ask about tobacco use.

*(**Rational**: Amonini and Donavon., (2006) found alcohol, tobacco and marijuana use increased with age).*

12. Have you ever tried cigarette smoking, even one or two puffs?
    A. Yes B. No

13. How old were you when you smoked a whole cigarette for the first time?
    A. I have never smoked a whole cigarette
    B. 10 years old or younger
    C. 11 to 15 years old
    D. 16 or 20 years old
    E. 21 or 25 years old
    F. Can't remember

14. During the past 30 days, on how many days did you smoke cigarettes?
    A. 0 days
    B. 1 or 2 days
    C. 3 to 5 days
    D. 6 to 9 days
    E. 10 to 19 days
    F. 20 to 29 days
    G. All 30 days

15. During the past 30 days, on the days you smoked, how many cigarettes did you smoke **per day**?
    A. I did not smoke cigarettes during the past 30 days
    B. Less than 1 cigarette per day
    C. 1 cigarette per day
    D. 2 to 5 cigarettes per day
    E. 6 to 10 cigarettes per day
    F. 11 to 20 cigarettes per day
    G. More than 20 cigarettes per day

16. During the past 30 days, how did you **usually** get your own cigarettes? (Select only **one** response.)
    A. I did not smoke cigarettes during the past 30 days
    B. I bought them in a store such as a convenience store, supermarket, discount store, or gas station
    C. I got them on the Internet
    D. I gave someone else money to buy them for me
    E. I borrowed (or bummed) them from someone else
    F. A person 18 years old or older gave them to me
    G. I took them from a store or family member
    H. I got them some other way

17. During the past 12 months, did you ever try **to quit** smoking cigarettes?
    A. I did not smoke during the past 12 months
    B. Yes
    C. No

The next 2 questions ask about electronic vapour products, such as blu, NJOY, or Starbuzz. Electronic vapour products include e-cigarettes, e-cigars, e-pipes, vape pipes, vaping pens, e-hookahs, and hookah pens.

(Rationale: The Japan Times Online 2014]- In the CDC study, researchers analyzed data from 2011, 2012, and 2013 National Youth Tobacco Surveys of students in grades 6-12. They found that more than 263,000 who had never smoked a conventional cigarette used e-cigarettes in 2013, up from 79,000 in 2011)

18. Have you ever used an electronic vapour product?
    A. A.Yes
    B. B.No

19. During the past 30 days, on how many days did you use an electronic vapour product?
    A. A.0 days
    B. B.1 or 2 days
    C. C.3 to 5 days
    D. D.6 to 9 days
    E. E.10 to 19 days
    F. F. 20 to 29 days
    G. G.All 30 days

The next 6 questions ask about drinking alcohol. This includes drinking beer, wine, wine coolers, and liquor such as rum, gin, vodka, or whiskey. For these questions, drinking alcohol does not include drinking a few sips of wine for religious purposes.

20. During your life, on how many days have you had at least one drink of alcohol?
    A. 0 days
    B. 1 or 2 days
    C. 3 to 9 days
    D. 10 to 19 days
    E. 20 to 39 days
    F. 40 to 99 days
    G. 100 or more days

21. How old were you when you had your first drink of alcohol other than a few sips?
    A. I have never had a drink of alcohol other than a few sips
    B. 10 years old or younger
    C. 11 to 15 years old
    D. 16 or 20 years old
    E. 21 or 25 years old
    F. Can't remember

22. During the past 30 days, on how many days did you have at least one drink of alcohol?
    A. 0 days
    B. 1 or 2 days
    C. 3 to 5 days
    D. 6 to 9 days
    E. 10 to 19 days
    F. 20 to 29 days
    G. All 30 days

23. During the past 30 days, on how many days did you have 5 or more drinks of alcohol in a row, that is, within a couple of hours?
    A. 0 days
    B. 1 day
    C. 2 days
    D. 3 to 5 days
    E. 6 to 9 days
    F. 10 to 19 days
    G. 20 or more days

24. During the past 30 days, what is the largest number of alcoholic drinks you had in a row, that is, within a couple of hours?
    A. I did not drink alcohol during the past 30 days
    B. 1 or 2 drinks
    C. 3 drinks
    D. 4 drinks
    E. 5 drinks
    F. 6 or 7 drinks
    G. 8 or 9 drinks
    H. 10 or more drinks

25. During the past 30 days, how did you **usually** get the alcohol you drank?
    A. I did not drink alcohol during the past 30 days
    B. I bought it in a store such as a liquor store, convenience store, supermarket, discount store, or gas station
    C. I bought it at a restaurant, bar, or club
    D. I bought it at a public event such as a concert or sporting event
    E. I gave someone else money to buy it for me
    F. Someone gave it to me
    G. I took it from a store or family member
    H. I got it some other way

(These questions, when asked, may be used to reference "anyone" in the family, or maybe asked specifically about someone you have been seeing romantically.)

Question obtained from NIH site: Alcohol Problems in Intimate Relationships: Identification and Intervention A Guide for Marriage and Family Therapists.

26. Does anyone in your family circle or friend consume alcohol (not sips but whole drink)?

A. Friend	☐ Yes	If yes how many_____(no of people)	No	☐
B. Family	☐ Yes	If yes how many_____(no of people)	No	☐
C. Relative	☐ Yes	If yes how many_____(no of people)	No	☐

27. Have you felt worried or upset about the drinking habits of anyone in your family?
    A. Yes B. No C. Maybe

28. Have you felt worried or upset about the drinking habits of anyone of your friends?
    A. Yes B. No C. Maybe

29. Are there disagreements in your family/friends about how, when, where, or why alcohol is used?
    A. Yes B. No C. Maybe

30. Do the drinking habits of anyone in your family/friends cause tension or conflict at home or at a regular hang out among friends?
A. Yes B. No C. Maybe

The next 4 questions ask about sexual behaviour.
*(**Rational**: Sheldon et al., (2010) found alcohol consumption among heavy drinking college students leads to risky sexual behaviour but the relation differs by gender and partner type.)*

18. Did you drink alcohol before you had sexual intercourse the **last time**?
A. I have never had sexual intercourse
B. Yes
C. No

19. The **last time** you had sexual intercourse; did you or your partner use a condom?
A. I have never had sexual intercourse
B. Yes
C. No

The next 4 questions ask about other health-related topics.

20. When was the last time you saw a doctor for a check-up, exam, regular medical needs?
A. During the past 12 months
B. Between 12 and 24 months ago
C. More than 24 months ago
D. Never
E. Not sure

21. On an average weeknight, how many hours of sleep do you get?
A. 4 or fewer hours
B. 5 hours
C. 6 hours
D. 7 hours
E. 8 hours
F. 9 hours
G. 10 or more hours

The next question asks about your academic achievements.

22. During the past 12 months, how would you describe your academic grades?
A. Mostly A's
B. Mostly B's
C. Mostly C's
D. Mostly D's
E. Mostly F's
F. None of these grades
G. Not sure

The last section of this questionnaire is to explore the type of friendship/peers/"*lepak*" buddies that you socialize with. The person who handed this questionnaire is the only person who will have this information and your responses here will not be shared with anyone including your friends.

You are required to seek permission from your friends prior to sharing their contact number with the researcher. Your friend's number will be deleted once they are contacted for a brief phone interview.

The last 5 question is on your friends/peers/ "*lepak"* buddies

23. Please list down nicknames of your friends and their phone number – also identify which type of friend you would consider the named individuals.

i. Name _____
Do you spend most of your time with this person, pls tick here____
OR do you interact with this person but not in a specific group_____
OR do you spend little time with this individual, pls tick here_____

ii. Name _____
Do you spend most of your time with this person, pls tick here____
OR do you interact with this person but not in a specific group_____
OR do you spend little time with this individual, pls tick here_____

iii. Name _____
Do you spend most of your time with this person, pls tick here____
OR do you interact with this person but not in a specific group_____
OR do you spend little time with this individual, pls tick here_____

iv. Name _____
Do you spend most of your time with this person, pls tick here____
OR do you interact with this person but not in a specific group_____
OR do you spend little time with this individual, pls tick here_____

v. Name _____
Do you spend most of your time with this person, pls tick here____
OR do you interact with this person but not in a specific group_____
OR do you spend little time with this individual, pls tick here_____

24. Among the list of friends mentioned above whom would you likely have alcohol drinks with?
Is it: pls circle or tick- you may choose more than one
i. ii. iii. iv. v.

25. Among the list of friends mentioned above, how many do consume alcohol_____(1, 2 or 3 or all)? How much do they consume?
    A. Don't know
    B. 1 or 2 drinks
    C. 3 drinks
    D. 4 drinks
    E. 5 drinks
    F. 6 or 7 drinks
    G. 8 or 9 drinks
    H. 10 or more drinks

26. Among the list of friends mentioned above whom would you likely *lepak* with?
    Is it: pls circle or tick- you may choose more than one
    i. ii. iii. iv. v.

This is the end of the survey.
Thank you very much for your help.