

# BMJ Open Social supply of alcohol to Korean high school students: a cross-sectional International Alcohol Control Study

Lydia S Asante,<sup>1,2</sup> Sungsoo Chun,<sup>2,3</sup> Mieun Yun,<sup>2</sup> Maxine Newell<sup>2,3</sup>

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<sup>1</sup>Department of Health-Bio Convergence, Sahmyook University, Seoul, Republic of Korea

<sup>2</sup>Korean Institute on Alcohol Problems, Sahmyook University, Seoul, Republic of Korea

<sup>3</sup>Department of Health Management, Sahmyook University, Seoul, Republic of Korea

## Correspondence to

Dr Sungsoo Chun; [chss97@syu.ac.kr](mailto:chss97@syu.ac.kr)

## ABSTRACT

**Purpose:** Underage drinking is strictly prohibited by law, nevertheless, adolescents report having access through social supply from family, friends and other members of the society. The aim of this study was to determine the primary suppliers of alcohol to Korean teenagers.

**Design:** Cross-sectional study.

**Setting:** Data were collected from 21 high schools in geographically diverse regions in South Korea from June to July 2012 as part of the International Alcohol Control Study.

**Participants:** Data were analysed from 247 high schoolers aged 16–18 years old as part of the International Alcohol Control Study.

**Primary and secondary outcome measures:** Social supply to high school students.

**Results:** More than 56% of high schoolers who participated in the International Alcohol Control Survey had been supplied alcohol at least once. Of this number, approximately 59% were males. Parents (especially fathers) and friends were the main suppliers, with friends contributing greater volumes (205 g) of alcohol. Of the number of students provided by mothers, 52% of them were females while 73% of respondents provided by friends were males. The most significant place for alcohol supply was at special events. Males were at higher odds for risky drinking.

**Conclusions:** These results support previous findings about the role of parents and friends in underage drinking in South Korean high school drinkers.

## INTRODUCTION

Adolescent alcohol consumption is a source of increasing concern in a number of countries.<sup>1</sup> This concern stems from the fact that underage drinking is associated with a number of negative health and social consequences such as impaired brain development and poor academic performance,<sup>2</sup> loss of memory, high-risk sexual behaviour, addiction, suicidal ideation, risky behaviours, alcohol-related injury and deaths.<sup>3 4</sup> The reasons adolescents drink may differ in relation to culture and the circumstances in

## Strengths and limitations of this study

- This study is limited by sample size and its cross-sectional nature.
- The study is strengthened by the diversity of location of participants.
- The use of the International Control Study as a survey instrument lends support to the credibility of this survey.

which they find themselves. Teenagers report that alcohol is an important ingredient in social interactions, permitting the drinker to lower their inhibitions while feeling more relaxed in social situations, fostering courage and increasing a sense of power, reducing worry and tension.<sup>5</sup> Although adolescents drink less often than adults, reports indicate that adolescents usually drink more when they engage in risky drinking.<sup>6</sup>

Although most countries have a set legal drinking age, underage drinking is still on the rise—of the 73 countries, which responded to the 2008 WHO Global Survey on Alcohol and Health, 71% reported an increase during the 5 years prior to the survey (WHO).<sup>7</sup> The first use of alcohol (defined as drinking a whole drink) typically occurs in early adolescence (at 13–14 years of age).<sup>8</sup> In South Korea where the legal drinking age is 19 years, statistics from the 2011 Korean Adolescent Health Behavior Online Survey showed that the age of first drinking experience was 13 years, whereas overall report of alcohol consumption among teenagers (13–18 years) trended downwards over the period of 2005–2011 from 54.1% to 51%; alcohol consumption is still high among older teenagers aged 16 (57.2%), 17 (67.15) and 18 (75.5%) years.<sup>9</sup>

Parental attitudes and peer influence have been cited as two of the most influential mediating factors of underage drinking. Previous studies have shown parental alcohol use as an important determinant of adolescents' drinking.<sup>10</sup> Parents' consumption patterns,

especially the father's, have been found to affect adolescents' drinking habits.<sup>11–13</sup> Recent research, however, shows that this relationship decreases once other factors are taken into account.<sup>14</sup> A vast body of research has documented a strong association between friends' and adolescents' alcohol use<sup>15</sup> especially when adolescents had a higher level of peer pressure.<sup>16 17</sup>

In South Korea, previous studies have examined the effects that parents' and friends' consumption patterns have on adolescents in South Korea, but none has provided an overview of the impact of social supply on underage drinking. The aim of the present study was, thus, to examine the social supply among Korean high schoolers, the characteristics of primary suppliers, places where alcohol is usually supplied and the odds of risky drinking (report of drinking more than four drinks on a usual drinking occasion in the past 6 months).

## METHODS

### Survey instrument

The survey instrument used for this study was the International Alcohol Control (IAC) study questionnaire. The IAC study is a collaborative cohort study across seven countries. It measures the impacts of key national level alcohol policies. Alcohol consumption measures included in this instrument include availability, pricing and taxation, social supply, marketing and drunk driving interventions. For the purposes of the present study, variables under social supply were assessed.<sup>18</sup>

### Sampling

Of the 2617 individuals who participated in the IAC study (June–July 2012), 438 (16.7%) were high school students aged 16–18 years. A total of 21 high schools (urban 7, suburban 8 and rural 6) were randomly selected from geographically diverse regions of Korea. Two hundred forty-seven (56.4%) high schoolers self-identified as drinkers. This number constituted the sample for the present study. Institutional review board (IRB) permission was obtained and approved this study (SYUIRB 2011-018). Participants in the study received a coded packet that contained the questionnaire and a copy of the informed consent, which delineated the proposed use of the data, benefits and risks of participating in the study as well as confidentiality rights. Completion of the questionnaire took approximately 30 min. All participants completed the questionnaire at the time given and received a gift.

### Variables

1. *Social supplier* This variable referred to persons who could at one time or the other (in the past 6 months) provide alcohol to teenagers. The present study considers fathers, mothers, siblings, other relatives, friends, partner (boyfriends and girlfriends), fellow schoolmates and strangers as the social suppliers of adolescents.
2. *Frequency of secondary supply* The frequency with which alcohol was socially supplied within the past 6 months

was analysed using time periods, which included weekly (once or more during the week), once a month, more than once monthly (several times in a month) and at least once in the past 6 months.

3. *Absolute alcohol volume* The absolute alcohol volume was calculated for all brands under study. This was to determine the standard amount of pure ethanol (12 g of ethanol) per glass and estimate the total quantity (in grams) of alcohol provided to teenagers by social suppliers on a usual drinking occasion. Volume of absolute alcohol intake (in millilitres) was computed as (% pure alcohol) × (drink size) × (number of drinks consumed) for each beverage consumed on any usual occasion in the past 6 months. The sum of the various beverage types determined the total absolute alcohol. The brands included beer, home-brewed beer, low-alcohol beer, wine, spirits, mixed cocktail, soju, takju, yakju and Korean traditional wine.
4. *Place* Places cited in the analysis included own home, another home, pubs, other clubs, restaurants, workplace (part-time jobs), special events and other places.
5. *Risky drinking* Risky drinking in this analysis refers to the consumption of more than four standard drinks of alcohol on a single occasion for male and female high schoolers.

### Methods of data analysis

SPSS V18.0,  $\chi^2$  and Fisher's exact tests were used to determine differences between demographic variables and supply of alcohol variables. A p value <0.05 was accepted as statistically significant. Logistic regression analysis was used to determine the associations between risky drinking (drinking more than four drinks on a usual occasion), demographic and social supply variables.

## RESULTS

Of the total sample of 2617 Korean drinkers and non-drinkers recruited for the IAC Study in 2012, almost 16.7% (438) were high school students aged 16–18 years. Of the 438 students, 247, representing 56.4%, self-identified as drinkers. More than half of all age groups reported ever drinking alcohol. With the exception of suburban respondents, more than 60% of teenagers from urban and rural communities had consumed alcohol at least once in their lifetime. Characteristics of the sample are shown in table 1.

Generally, 125 respondents representing more than half of all respondents (54.8%) had been provided alcohol more than once in the past 6 months. A higher number of males (13.7%) had been supplied alcohol more frequently than females (7.2%) in the past 6 months. Older teenagers aged 18 years (13%) received alcohol more frequently compared with their juniors. Urban dwellers reported more frequent supply of alcohol in the past 6 months compared with suburban and rural dwellers (see table 2).

**Table 1** Characteristics of sample, N (%)

	Drinker	Non-drinker
Total	247 (56.4)	191 (43.6)
Gender		
Male (n=233)	145 (62.2)	88 (37.8)
Female (n=205)	102 (49.8)	103 (50.2)
Age		
16 (n=113)	68 (60.2)	45 (39.8)
17 (n=146)	82 (56.2)	64 (43.8)
18 (n=179)	97 (54.2)	82 (45.8)
Residence		
Urban (n=240)	145 (60.4)	95 (39.6)
Suburban (n=152)	73 (48)	79 (52)
Rural (n=45)	28 (62.2)	17 (37.8)

Table 3 examines the supplier of alcohol to high school students in the past 6 months. Stratified by gender, statistical significance at  $p < 0.05$  was found when mothers and friends were suppliers. Mothers were the main supplier to female respondents while friends supplied alcohol to male students. With increase in age, supply shifted from mothers and friends to siblings, other relatives and schoolmates (table 3).

Self-report of places where alcohol was usually provided in the past 6 months were generally higher in own home, others' home and at special events. Significant differences were reported between gender at other home, pubs and other places. At  $p = 0.035$ , 60.7% and 48% of male and female respondents, respectively, received alcohol at other homes. In total, 46.5% of male respondents and 28% of females received alcohol at pubs ( $p = 0.003$ ). Supply at special events was significantly different between the different age groups with a greater percentage in the 16-year-olds. Among the different places of residence, significant differences were found for supply of alcohol at other places (see table 4).

Table 5 examines the association between risky drinking, demographic and supplier variables. On a usual drinking occasion, boys were seven times more likely to

report risky drinking at statistically significant levels ( $p < 0.001$ ). The odds of risky drinking was significantly greater for high schoolers provided alcohol by friends (OR 5.67; 95% CI 2.54 to 12.68) compared with other suppliers. Those who drank in pubs had higher odds of risky drinking (OR 1.99; CI 1.09 to 3.65).

## DISCUSSION

Despite the existence and enforcement of prohibition laws against purchasing of alcohol by minors (<19 years), alcohol remains accessible to teenagers through alternate channels.<sup>19</sup> The focus of this study was to examine the various sources of alcohol to Korean high school drinkers. Major findings include (1) among high school drinkers, an adult (person aged 19 and above) was the most common source of alcohol, (2) while mothers were the main providers to females, friends supplied more alcohol (in greater volumes) than parents and (3) high schoolers who consumed alcohol in pubs and clubs were more likely to engage in risky drinking.

A significant factor contributing to underage drinking is social supply of alcohol to teenagers. One of the mechanisms by which this supply may influence alcohol-related problems is by decreasing the age of onset of drinking.<sup>20–21</sup> Korean high school drinkers reported obtaining alcohol from multiple sources including parents, siblings, other relatives, friends, fellow students, partners and even strangers. Of these sources, persons older than 19 years were the main sources. Adults, especially parents, have an important role in the socialisation of their children on the issue of alcohol use. Contrary to medical reports of the problems associated with early initiation of drinking, some parents are of the view that providing alcohol to their children teaches responsible drinking and controls the quantity consumed.<sup>22–23</sup> Results from our analysis showed that among South Korean parents, fathers were more likely to supply alcohol to their children than were mothers (30.4% vs 21.1% of adolescents).

**Table 2** Frequency (percentages) of supply of alcohol in the past 6 months to high schoolers, N (%)

	Frequency (%)			
	Weekly	Monthly	More than monthly	At least once
Total	14 (6.1)	11 (4.8)	100 (43.9)	103 (45.2)
Gender				
Male (n=131)	11 (8.4)	7 (5.3)	53 (40.5)	60 (45.8)
Female (n=97)	3 (3.1)	4 (4.1)	47 (48.5)	43 (44.3)
Age				
16 (n=62)	2 (3.2)	3 (4.8)	28 (45.2)	29 (46.8)
17 (n=74)	6 (8.1)	2 (2.7)	34 (45.9)	32 (43.2)
18 (n=92)	6 (6.5)	6 (6.5)	38 (41.3)	42 (45.7)
Residence				
Urban (n=134)	10 (7.5)	8 (6.0)	51 (38.1)	65 (48.5)
Suburban (n=69)	3 (4.3)	3 (4.3)	34 (49.3)	29 (42)
Rural (n=25)	1 (4.0)	–	15 (60.0)	9 (36.0)

**Table 3** Supplier of alcohol in the past 6 months, (N) %

	Supplier of alcohol (% in the past 6 months)*							
	Father	Mother	Siblings	Other relatives	Friends	Partner	Schoolmate	Stranger
Total	(75) 30.4	(52) 21.1	(15) 6.1	(25) 10.1	(63) 25.5	(4) 1.6	(15) 6.1	(2) 0.8
Gender								
Male (n=145)	(43) 29.7	(25) 17.2	(8) 5.5	(16) 11	(46) 31.7	(2) 1.4	(11) 7.6	(1) 0.7
Female (n=102)	(32) 31.4	(27) 26.5	(7) 6.9	(9) 8.8	(17) 16.7	(2) 2	(4) 3.9	(1) 1.0
Age								
16 (n=68)	(22) 32.4	(15) 22.1	(3) 4.4	(6) 8.8	(20) 29.4	(1) 1.5	(3) 4.4	(1) 1.5
17 (n=82)	(21) 25.6	(18) 22	(5) 6.1	(9) 11	(20) 24.4	(2) 2.4	(5) 6.1	–
18 (n=97)	(32) 33	(19) 19.6	(7) 7.2	(10) 10.3	(23) 23.7	(1) 1	(7) 7.2	(1) 1
Residence								
Urban (n=145)	(43) 29.7	(30) 20.7	(9) 6.2	(17) 11.7	(37) 25.5	(3) 2.1	(7) 4.8	–
Suburban (n=73)	(21) 28.8	(17) 23.3	(5) 6.8	(6) 8.2	(19) 26	(1) 1.4	(6) 8.2	(2) 2.7
Rural (n=28)	(11) 39.3	(5) 17.9	(1) 3.6	(2) 7.1	(7) 25	–	(2) 7.1	–

\*Percentages of positive responses do not add up to 100% as respondents selected more than one source. Italic figures show  $\chi^2$  significance at  $p < 0.05$ .

The assumption is that when parents provide alcohol to their children, it may serve a protective effect for alcohol abuse. However, conflicting knowledge exists regarding the protective effect of parental approval of underage alcohol consumption. While some studies indicate that parents who provide alcohol to their children are more likely to have children who never abuse alcohol,<sup>24</sup> others show that consuming alcohol at home leads to increased drinking among teenagers.<sup>25</sup> Our research supported the former assumption that teenagers supplied alcohol by their parents were more likely to consume lower amounts of absolute alcohol (122 g and 115 g by mothers and fathers, respectively, compared with friends) and less likely to be involved in risky drinking (OR 0.92; CI 0.49 to 1.74). Research has proven that providing alcohol to an adolescent indicates approval of underage alcohol use. This disregard of underage drinking may, however, lead to future substance abuse.<sup>26</sup> Parental approval of underage drinking is, however, rife as 13% of American youth, aged 11–17 years, have drunk alcohol with their

families.<sup>27–28</sup> Our results showed that the volume of alcohol provided by friends exceeded that of parents (205 g of absolute alcohol). At the same time, teenagers who were supplied alcohol by friends (OR 5.67; CI 2.54 to 12.68) and those who drank at locations other than their own homes, that is, at pubs (OR 1.99; CI 1.09 to 3.65) were at higher odds of risky drinking. We speculate that high schoolers may have had access to alcohol at pubs, special events and other places without age identification. South Korean laws that require suppliers to ascertain the age of a youth (under the age of 19) before supply of any harmful drugs need to be enforced to decrease supply of alcohol to teenagers at pubs, special events and other places. Although the influence of peers on alcohol use is of greater magnitude, contradictory research indicates that a positive family environment could attenuate the negative impact of peers on adolescent drinking.<sup>29</sup>

The Food Sanitation Act of South Korea prohibits the act of allowing minors access to licensed liquor

**Table 4** Supply of alcohol at place (x) in the past 6 months, (N) %

	Places where alcohol is usually supplied (% in the past 6 months)*							
	Own home	Other home	Pubs	Other clubs	Restaurants	Meetings	Special events	Other places
Total	(139) 56.3	(132) 53.4	(94) 38.1	(42) 17	(8) 3.2	(39) 37.2	(112) 46.6	(62) 25.1
Gender								
Male (n=145)	(76) 56.3	(85) 60.7	(66) 46.5	(26) 18.4	(5) 3.5	(52) 37.1	(66) 47.3	(41) 36.4
Female (n=102)	(63) 64.9	(47) 48	(28) 28	(16) 16.1	(3) 3	(40) 40	(46) 46.1	(11) 10.9
Age								
16 (n=68)	(39) 59.1	(41) 60.3	(23) 33.8	(17) 24.5	(5) 7.5	(27) 40.3	(47) 70.1	(22) 32.4
17 (n=82)	(48) 60	(46) 58.2	(30) 37	(8) 9.8	–	(27) 33.3	(30) 37.1	(14) 18.1
18 (n=97)	(52) 60.5	(45) 49.5	(41) 44.1	(17) 18.4	(3) 3.3	(38) 41.3	(35) 38.1	(26) 28.7
Residence								
Urban (n=145)	(86) 63.7	(74) 53.2	(60) 42.9	(26) 18.7	(6) 4.2	(56) 39.7	(62) 45	(35) 25.1
Suburban (n=73)	(38) 55.1	(42) 59.2	(27) 37	(12) 16.5	(2) 2.8	(28) 39.4	(33) 45.4	(25) 34.5
Rural (n=28)	(15) 55.6	(16) 59.3	(6) 21.4	(2) 7.1	–	(8) 29.6	(17) 38.6	(2) 7.1

\*Percentages of positive responses do not add up to 100% as respondents selected more than one source. Italic figures show  $\chi^2$  significance at  $p < 0.05$ .



**Table 5** OR of risky drinking on a usual drinking occasion in the past 6 months

Covariate	% (SE)	OR (95% CI)	p Value
Gender			
Male	74.36 (0.31)	7.38 (4.05 to 13.46)	0.000
Female	25.63 (0.31)	1	
Age			
16	26.86 (0.39)	1.26 (0.59 to 2.71)	0.555
17	34.38 (0.37)	0.84 (0.40 to 1.74)	0.637
18	38.75 (0.31)	1	
Supplier			
Parent	32.5 (0.32)	0.92 (0.49 to 1.74)	0.804
Friend	47.5 (0.37)	5.67 (2.54 to 12.68)	0.000
Other	18.75 (0.39)	1.26 (0.49 to 1.74)	0.557
Stranger	1.25 (0.21)	1	
Place			
Own home	22.5 (0.30)	1	
Another home	18.75 (0.29)	1.13 (0.637 to 2.02)	0.669
Pubs/clubs	43.13 (0.31)	1.99 (1.09 to 3.65)	0.025
Special events	15.63 (0.41)	1.78 (0.80 to 3.96)	0.159

establishments and providing any alcoholic beverages to children.<sup>30</sup> These prohibitive laws against underage drinking do not, however, explicitly cover supply in private and off-licensed premises. The USA, on the other hand, has introduced initiatives aimed at restricting social sources of supply, including laws against adult provision of alcohol to minors and the creation of enforcement mechanisms that allow police to enter private premises where underage drinking is happening.<sup>31</sup> There have also been efforts to register beer kegs so that police can trace the adult purchaser of alcohol provided to underage drinkers.<sup>32</sup> Prohibitive laws in South Korea can be extended to cover not just purchase but supply of alcohol at all places including private premises.

Results from this research will pave the way in Korea for a more detailed exploration of all factors associated with the social supply of alcohol to teenagers as well as the long-term effects of this supply on adolescent development. This study, limited by its cross-sectional design is, however, strengthened by the use of the International Control Study questionnaire as an assessment tool. Generalisations of the whole population of South Korean teenagers cannot be made as the sample of this survey was limited by age and total sample size. However, the diversity of locations used is advantageous as results for drinking rates (33.1% males; 23.1% females) are similar to information from the Ministry of Health and Welfare showing prevalence of underage drinking (26.1% males; 22.6% females). Future studies of a larger sample (across a larger and diverse age grouping) can be used to assess the full extent of social supply in South Korean teenage drinkers. Studies to determine the relationship between social supply and outlet density would be an interesting topic for future research.

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**Collaborators** Korean Institute on Alcohol Problems researchers.

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