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EDITORIAL

Alcohol Related Disorders in Asia Pacific Region: Prevalence, Health Consequences and Impacts on the Nations

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Abstract

Background: In Asia Pacific (AP) region, the exact picture of the alcohol use problems has remained relatively obscure. In this study, the profile of alcohol consumption and alcohol related disorders in AP countries are presented.
Methods: Official statistics on average alcohol consumption (alcohol per capita consumption, APC), alcohol related health variables, income group and alcohol policy of countries geographically related to Asia and Oceania continents were extracted from the 2014 edition of World Health Organization report on global status of alcohol and health.
Results: The data of 57 AP countries were analyzed. Two-third of the countries did not establish comprehensive national monitoring systems (NMSs). Median of total APC in people aged 15 years and older was 2.4 (1-4.6) L during 2003 to 2005, while this indicator was 2.8 (1-5.5) L during 2008 to 2010 which accounts for about 0.4 L (in median) increase in consumption. In 13 countries which were mostly located in South-east Asia and the Pacific region, APC was higher than average global consumption. Comparing the countries with and without total ban policy, the countries with total ban policy had significantly lower APC ($P = 0.003$), higher rate of abstainers ($P = 0.002$) and lower rate of alcohol related disorders ($P < 0.001$). Higher APC and higher rates of alcohol related disorders were observed in higher income countries.
Conclusion: Alcohol consumption in AP region is comparatively lower than global average. However, the status of some countries in Southeast Asia and Pacific region is alarming and needs serious attention. Moreover, establishment of comprehensive NMSs, proper data registry and holistic harm reduction and rehabilitation programs for users should receive meaningful governmental and public support.

Keywords: Alcohol Drinking; Alcohol-Related Disorders; Asia; Oceania

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INTRODUCTION

Alcohol consumption claims approximately 3 million lives each year worldwide (1). It additionally leaves social and economic sequels on individuals and nations. Alcohol attributable deaths have shown an increasing trend in recent years rising from 2.5 million in 2004 to 3.3 million deaths in 2012 which translates to 4 to 6% of all deaths worldwide during this period (1,2). This corresponds to the rise in alcohol consumption in the same period (3). Importantly, the harmful use of alcohol (HUA) ranks among the top five risk factors for disease, disability and death worldwide (4,5). Hence, in the recent years, World Health Organization (WHO) has called to all countries for prioritizing the reduction of the alcohol-attributable burden as a key public health policy (6,7).

The alarming global estimates of alcohol consumption in the population 15 years of age and over that is to be about 8 times higher than illicit drugs use (42% vs. 5%) (8), as well as its inherent health consequences, should drive attention of health authorities across the world to commence effective measures and build public awareness on this major growing health threat. To take an example, heavy episodic drinking (HED) commonly known as binge drinking has been reported to be eight times more prevalent than problematic drug use (8).

In Asia Pacific (AP) region, due to lack of proper reporting as well as some legal restrictions, the exact picture of the alcohol use problems has remained relatively obscure. In this paper, the profile of alcohol consumption and alcohol related disorders in AP countries are presented and the impacts of socioeconomic features and national policies on these health variables are analyzed.

METHODS

In this descriptive analytical study, official statistics on average alcohol consumption (annual alcohol per capita consumption (APC) in liter) during 2008 to 2010, the rate of HED, the rate of alcohol use disorders (AUDs) including alcohol dependence (AD) and harmful use of alcohol (HUA) in 2010, alcohol-attributable fraction (AAF) of burden of

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diseases in 2012, years of life lost (YLL) score in 2012, adult literacy rate (ALR), rate of alcohol abstainers and the national alcohol policy (until 2012) of countries geographically related to Asia and Oceania continents were extracted from the 2014 edition of WHO report on global status of alcohol and health (1), and were entered into a predesigned checklist (Table 1). The average of total alcohol consumption during 2008-2010 was compared with the average of total alcohol consumption during 2003 to 2005 obtained from 2011 edition of WHO report on global status of alcohol and health (2). Change in alcohol consumption was defined according to moving average as it is explained and reported in the 2014 WHO report (1). In order to evaluate the status of official reporting of alcohol consumption in each country, the ratio of estimates of unrecorded alcohol consumption to total consumption was assessed. Socioeconomic features of the countries including income group according to World Bank (WB) classification (9), and youth population rate (people aged 15 to 24 years) based on 2013 version of United Nations Demographic Yearbook (10), were also recorded for each country in the checklist.

YLL score of alcohol consumption was defined as a score from 1 to 5 based on the percentage of years of life lost that can be attributable to alcohol use (1 showed the lowest percentage and 5 showed the highest percentage) (1). The AAF denotes the proportion of a health outcome which is caused by alcohol consumption (i.e. that proportion which would disappear if alcohol consumption was removed) (1). HUA means a pattern of alcohol use that causes damage to health, either organically (as in liver cirrhosis) or mentally (as in depression secondary to heavy alcohol consumption) (1). AD is known as a cluster of behavioral, cognitive, and physiological phenomena ensuing after repeated alcohol use which manifests with a strong desire to consume alcohol, difficulties in controlling alcohol use, persisting in alcohol use despite harmful consequences, a higher priority given to alcohol use than to other activities and obligations, increased tolerance, and sometimes a physiological withdrawal state (1). The rate of AUDs in this study comes from the sum of the rates of HUA and AD. In this study, alcohol abstainers were considered as people who did not drink any alcohol in the previous 12-month period, who can either be former drinkers or lifetime abstainers.

Total alcohol ban policy exists in some countries where alcohol use, selling and advertising are totally prohibited. In number of other countries, where total ban on alcohol use is not imposed, some measures have been taken to control alcohol consumption denoted as national monitoring systems (NMSs). These measures monitor alcohol status in 4 aspects: alcohol consumption, health consequences, social consequences and alcohol policy responses. In this study, only countries that had maintained all 4 aspects were considered as having NMSs.

The collected data were entered into Statistical Package for Social Sciences (SPSS Inc., Chicago, USA) and were analyzed with appropriate tests. The normality of data was analyzed using Shapiro-Wilk's test. Having non-normal distribution, the data are presented with median and interquartile range (IQR). Correlation between two variables was analyzed using Pearson's test. For comparison of data distribution between two groups Man Whitney U-test, and among more than 2 groups Kruskal Wallis H test was used. P values less than 0.05 were considered statistically significant.

RESULTS

Sociodemographic profile

In this study, the status of alcohol consumption and alcohol related disorders in 57 AP countries were analyzed (Table 1). According to WB information, most of the countries were classified in the lower middle income group (43.8%) followed by countries classified as high income (21.1%), upper middle income (21.1%) and low income (14.0%). Median (IQR) of ALR and youth population rate in these countries were 92.5 (79.5-96.3) % and 18.8 (16.6-20.2) %, respectively.

Alcohol consumption

In the countries studied, median of total APC in people aged 15 years and older was 2.4 (1-4.6) L during 2003 to 2005, while this indicator was 2.8 (1-5.5) L during 2008 to 2010 which accounts for about 0.4 L (in median) increase in consumption. During 2008-2010, the average APC in men was 5.3 times higher than women (relevant data not shown in the table 1). The highest level of APC (during 2008-2010) was observed in South Korea (12.3 L), Australia (12.2 L), New Zealand (10.9 L), Kazakhstan (10.3 L) and Niue (8.0 L). Countries with the lowest levels of alcohol consumption were Kuwait (0.1 L), Pakistan (0.1 L), Bangladesh (0.2 L), Saudi Arabia (0.2 L) and Yemen (0.3 L).

Comparing the two WHO reports, the average of alcohol consumption remained unchanged in the majority of countries (56.1%); while, it increased in 24.6% and decreased in 19.3% of countries.

Alcohol policy

Total ban on alcohol use has been implemented in 7 countries (12.3%) including Iran, Syria, Yemen, Afghanistan, Brunei, Maldives and Saudi Arabia. All aspects of NMSs were established in only 33.3% of countries.

Alcohol related disorders and health impacts

Based on the 2014 version of WHO report, median (IQR) rate of HED was 1.4 (0.1-7.7) %, median (IQR) AAF was 2.1 (1.2-4.9) % and median (IQR) score of YLL due to alcohol was 2.0 (1.0-3.5) in the AP countries. The highest HED rate was seen in Mongolia (27%), Niue (25.7%), Japan (17.5%), Samoa (16.8%) and Solomon Islands (16.4%); and the highest AAF was observed in Mongolia (10.5%), Kazakhstan (9.2%), Vietnam (8.3%), South Korea (7.5%), Thailand (6.8%) and United Arab Emirates (6.8%). Countries with the highest YLL score (scored as 5) in this region were Mongolia, Kazakhstan, Vietnam, South Korea, Thailand, and United Arab Emirates.

In the countries studied (during 2008-2010), median (IQR) rate of AUDs was reported to be 2.9 (0.8-4.7) % including the rate of AD (median (IQR): 1.4 (0.3-2.9) %) and HUA (median (IQR): 1.5 (0.4-1.7) %). The highest rate of AUDs was seen in Mongolia (6.4%), South Korea (6.2%), Kazakhstan (5.2%), Kyrgyzstan (5.2%), Turkmenistan (5.2%) and Uzbekistan (5.2%).

Table 1. Alcohol consumption and alcohol-related health variables in Asian Pacific countries

Rank*	Sociodemographic profile of countries					Alcohol consumption				Morbidity & Mortality			Alcohol-related disorders			Policy	
	Country	Income group**	Youth population (%)	ALR (%)	Alcohol abstainers (%)	Total 2008-2010 (Recorded –Unrecorded) (L/Capita)	Total 2003-2005 (L/Capita)	Change in consumption	Ratio of unrecorded to total consumption 2008-2010 (%)	HED (%)	AAF (%)	YLL score	AUD (%)	AD (%)	HUA (%)	Total ban	NMSs
1	Mongolia	LM	18.7	97	54.3	6.9 (4.9-2.0)	4.1	↑	29.0	27.0	10.5	5	6.4	2.8	3.6	No	Yes
2	South Korea	H	13.5	98	55.2	12.3 (9.8-2.5)	12.3	→	20.3	6.0	7.5	5	6.2	4.7	1.5	No	Yes
3	Uzbekistan	LM	20.5	99	62.8	4.6 (2.4-2.1)	3.8	↑	45.7	10.2	4.9	3	5.2	3.3	1.9	No	No
4	Kazakhstan	UM	16.1	100	60.6	10.3 (6.8-3.5)	11.3	→	34.0	7.8	9.2	5	5.2	3.3	1.9	No	Yes
5	Kyrgyzstan	L	18.8	99	61.8	4.3 (2.4-1.90	5.1	↓	44.2	7.7	5.8	4	5.2	3.3	1.9	No	No
6	Turkmenistan	LM	20.2	100	60.7	4.3 (2.2-2.2)	4.7	→	51.2	11.7	4.9	4	5.2	3.3	1.9	No	No
7	Thailand	UM	15	94	70.3	7.1 (6.4-0.7)	6.8	→	9.9	1.1	6.8	5	5.0	1.8	3.2	No	Yes
8	China	UM	14.7	95	55.9	6.7 (5.0-1.7)	4.9	↑	25.4	7.6	6.3	4	4.9	2.5	2.5	No	No
9	Vietnam	LM	18.8	93	61.7	6.6 (2.0-4.6)	3.8	↑	69.7	1.4	8.3	5	4.7	2.9	1.7	No	No
10	Fiji	LM	17.1	96	58.6	3.0 (2.0-1.0)	2.4	↑	33.3	10.9	1.4	2	4.7	3.0	1.7	No	No
11	Cook Islands	UM	17.9	95	54.9	6.4 (5.9-0.5)	3.7	↑	7.8	NR	6.1	NR	4.7	3.0	1.7	No	Yes
12	Kiribati	LM	21.3	NR	69.0	3.0 (1.0-2.0)	3.3	→	66.7	2.5	2	NR	4.7	3.0	1.7	No	No
13	Nauru	UM	23.1	NR	71.9	3.5 (1.0-2.5)	3.5	→	71.4	NR	1.7	NR	4.7	3.0	1.7	No	NR
14	Niue	UM	15.0	95	56.0	8.0 (7.0-1.0)	8.8	→	12.5	25.7	5.4	NR	4.7	3.0	1.7	No	No
15	Palau	UM	17.4	92	45.0	7.9 (6.9-1.0)	8.2	→	12.7	NR	4.6	NR	4.7	3.0	1.7	No	No
16	Samoa	LM	20.1	99	54.7	3.6 (2.6-1.0)	4.8	↓	27.8	16.8	2.0	NR	4.7	3.0	1.7	No	NR
17	Tuvalu	LM	20.6	NR	75.6	1.5 (1.0-0.5)	1.9	↓	33.3	NR	2.2	NR	4.7	3.0	1.7	No	Yes
18	Philippines	LM	19	95	55.7	5.4 (4.6-0.9)	6.4	↓	16.7	1.9	5.2	3	4.6	2.9	1.7	No	No
19	Papua New Guinea	LM	19.7	60	65.4	3 (1.5-1.5)	3.5	↓	50.0	9.6	3.1	2	4.6	2.9	1.7	No	No
20	Vanuatu	LM	19.8	82	68.2	1.4 (0.9-0.5)	1.5	→	35.7	7.5	1.6	NR	4.6	2.9	1.7	No	NR
21	Solomon Islands	LM	20.0	84	67.8	1.7 (1.2-0.5)	1.6	→	29.4	16.4	2.1	2	4.6	2.9	1.7	No	NR
22	Laos	LM	21.3	73	52.1	7.3 (6.2-1.1)	6.7	→	15.1	14.6	4.9	3	4.5	2.8	1.7	No	No
23	Micronesia	LM	20.2	89	59.3	3.3 (2.3-1.0)	4.2	↓	30.3	12.8	2.1	NR	4.5	2.8	1.7	No	Yes
24	Tonga	LM	19.3	99	67.0	1.6 (1.1-0.5)	1.7	→	31.3	6.9	1.1	NR	4.5	2.8	1.7	No	No
25	Cambodia	L	20.5	78	61.6	5.5 (2.2-3.3)	4.6	↑	60.0	1.4	5.0	3	4.4	2.7	1.6	No	No
26	Australia	H	13.3	96	16.0	12.2 (10.4-1.8)	10.1	↑	14.8	10.9	3.2	3	3.5	1.5	2	No	Yes
27	New Zealand	H	13.9	99	20.5	10.9 (9.3-1.6)	9.4	↑	14.7	4.5	2.8	3	3.2	1.4	1.9	No	Yes
28	Sri Lanka	LM	14.9	91	81.7	3.7 (2.2-1.5)	2.2	↑	40.5	0.4	5.8	4	3.0	2.7	0.4	No	NR
29	North Korea	L	16.3	100	78.9	3.7 (3.2-0.5)	3.7	→	13.5	4.5	4.6	3	2.9	1.4	1.5	No	NR
30	Japan	H	9.7	99	31.1	7.2 (7.0-0.2)	8.0	↓	2.8	17.5	3.2	3	2.8	1.1	1.7	No	Yes
31	India	LM	18.1	74	84.9	4.3 (2.2-2.2)	3.6	↑	51.2	1.7	5.4	4	2.6	2.1	0.5	No	Yes
32	Malaysia	UM	16.9	93	87.3	1.3 (0.3-1.0)	0.8	↑	76.9	0.3	1.7	2	2.4	1.1	1.3	No	Yes

Table 1. Alcohol consumption and alcohol-related health variables in Asian Pacific countries

Rank*	Sociodemographic profile of countries					Alcohol consumption				Morbidity & Mortality			Alcohol-related disorders			Policy	
	Country	Income group**	Youth population (%)	ALR (%)	Alcohol abstainers (%)	Total 2008-2010 (Recorded –Unrecorded) (L/Capita)	Total 2003-2005 (L/Capita)	Change in consumption	Ratio of unrecorded to total consumption 2008-2010 (%)	HED (%)	AAF (%)	YLL score	AUD (%)	AD (%)	HUA (%)	Total ban	NMSs
33	Maldives	UM	23.4	98	91.0	1.20 (0.7-0.5)	0.3	→	41.7	0.4	1.9	NR	1.9	0.9	1.0	Yes	No
34	Brunei	H	17.3	95	79.6	0.9 (0.6-0.3)	0.3	→	33.3	0.6	1.3	NR	1.8	0.8	1.0	Yes	No
35	Bhutan	LM	20.1	53	89.7	0.7 (0.4-0.3)	1.1	→	42.9	0.7	1.2	1	1.7	0.8	0.9	No	NR
36	Nepal	L	22.6	66	92.4	2.2 (0.2-2.0)	2.4	→	90.9	0.4	2.9	2	1.5	0.7	0.8	No	Yes
37	Myanmar	L	18.3	92	92.1	0.7 (0.1-0.6)	0.6	→	85.7	0.1	2	2	1.5	0.7	0.8	No	Yes
38	Timor leste	LM	19.8	51	92.9	0.6 (0.1-0.5)	0.9	→	83.3	0.1	1.2	1	1.5	0.7	0.8	No	No
39	Bahrain	H	15.9	91	90.2	2.1 (2.0-0.1)	4.0	↓	4.8	0.1	0.8	1	1.2	0.3	1.0	No	NR
40	Singapore	H	17.8	95	50.1	2.0 (1.5-0.5)	1.0	↑	25.0	4.4	2.2	2	0.9	0.5	0.4	No	Yes
41	Lebanon	UM	17.2	90	89.9	2.4 (1.9-0.5)	2.3	→	20.8	0.1	1.5	2	0.8	0.3	0.5	No	NR
42	Bangladesh	L	18.8	56	98.1	0.2 (0.0-0.2)	0.2	→	100	<0.1	0.6	1	0.8	0.7	0.1	No	No
43	Indonesia	LM	17.1	93	91.9	0.6 (0.1-0.5)	0.6	→	83.3	2.6	2.1	2	0.8	0.7	0.0	No	Yes
44	Tajikistan	L	20.1	100	90.7	2.8 (0.3-2.5)	3.4	↓	89.3	1.0	3.6	2	0.8	0.4	0.4	No	Yes
45	Djibouti	LM	22.0	70	94.2	1.3 (1.1-0.2)	1.9	↓	15.4	0.1	2.0	1	0.7	0.2	0.4	No	NR
46	United Arab Emirates	H	13.7	78	87.0	4.3 (2.8-1.5)	2.5	↑	34.9	0.2	6.8	5	0.5	0.3	0.3	No	NR
47	Syria	LM	20.2	84	92.5	1.2 (1.0-0.3)	1.4	↓	25.0	<0.1	0.7	1	0.5	0.2	0.3	Yes	No
48	Jordan	UM	20.4	92	95.3	0.7 (0.5-0.2)	0.8	→	28.6	<0.1	0.4	1	0.4	0.2	0.2	No	No
49	Kuwait	H	15.3	94	90.3	0.1 (0.0-0.1)	0.1	→	100	0.4	1.1	1	0.4	0.2	0.1	No	NR
50	Oman	H	19.9	87	94.1	0.9 (0.7-0.2)	1.0	→	22.2	<0.1	0.8	1	0.4	0.2	0.1	No	Yes
51	Qatar	H	13.4	95	93.3	1.5 (0.9-0.6)	1.2	→	40.0	<0.1	3.1	3	0.3	0.1	0.2	No	NR
52	Pakistan	LM	21.5	56	96.0	0.1 (0.0-0.0)	0.1	→	0.0	0.1	0.5	1	0.3	0.2	0.1	No	Yes
53	Saudi Arabia	H	19.3	86	94.2	0.2 (0.1-0.1)	0.3	→	50.0	<0.1	0.5	1	0.3	0.2	0.1	Yes	NR
54	Iraq	LM	19.6	80	94.6	0.5 (0.2-0.3)	0.4	→	60.0	<0.1	0.4	1	0.3	0.2	0.1	No	No
55	Yemen	LM	21.1	62	95.9	0.3 (0.1-0.2)	0.3	→	66.7	<0.1	0.5	1	0.3	0.2	0.1	Yes	No
56	Iran	UM	18.7	85	95.8	1.0 (0.0-1.0)	1.0	→	100	<0.1	0.8	1	0.3	0.2	0.1	Yes	No
57	Afghanistan	L	22.2	28	96.3	0.7 (0.0-0.7)	0.0	→	100	0.1	0.7	1	0.3	0.2	0.1	Yes	No

-ALR: Adult literacy rate
-HED: Heavy episodic drinking
-AAF: Alcohol attributable fraction
-YLL: Years of life lost
-AUD: Alcohol use disorders
-AD: Alcohol dependence
-HUA: Harmful use of alcohol
-NMSs: National monitoring systems
-NR: Not reported
* Ranking is based on the rate of AUDs
** Income groups: Low (L), Lower Middle (LM), Upper Middle (UM), High (H)

In this respect, the highest rate of AD was observed in South Korea (4.7%), Kazakhstan (3.3%), Kyrgyzstan (3.3%), Turkmenistan (3.3%) and Uzbekistan (3.3%). On the other hand, the lowest rate of AUDs was found in Afghanistan, Iran, Yemen, Iraq, Saudi Arabia, Pakistan and Qatar (0.3% for each)

Analysis of correlation

Countries in higher income groups had significantly higher ALR (P = 0.005, r = 0.374), Lower youth population (P < 0.001, r = -0.575), more alcohol consumption (P = 0.046, r = 0.265) and lower ratio of unrecorded consumption to total consumption (P = 0.003, r = -0.388). Moreover, rate of abstainers was higher in countries categorized in lower WB income groups, though the probability value was only close to the level of statistical significance (P = 0.086, r = -0.229). All health related variables including HED, AAF, YLL score, AUDs, AD and HUA were significantly higher in countries with higher alcohol consumption (P < 0.001 for each). AAF was significantly higher in countries with higher AUDs (P < 0.001, r = 0.640).

In countries with higher rate of youth population, total alcohol consumption (P < 0.001, r = -0.465), AAF (P = 0.008, r = -0.350) and YLL score (P = 0.001, r = -0.513) were significantly lower. Moreover, countries with younger population had higher rates of abstainers (P = 0.002, r = 0.403). Nevertheless, the rate of youth population was not correlated to HED, AUD, AD and HUA.

Moreover, ALR was positively and significantly associated with total consumption (P = 0.002, r = 0.414) and all health variables including HED (P = 0.025, r = 0.310), AAF (P = 0.006, r = 0.368), YLL score (P = 0.001, r = 0.481), AUDs (P = 0.002, r = 0.404), AD (P = 0.009, r = 0.353), HUA (P = 0.002, r = 0.414). ALR, however, was inversely correlated with the rate of abstainers (P = 0.001, r = -0.485).

Analysis of Differences

Comparing the countries with and without total ban policy (Table 2), the countries with total ban policy had significantly lower alcohol consumption (P = 0.003), higher rate of abstainers (P = 0.002), lower rate of HED (P = 0.003), lower rate of AAF (P = 0.001), lower YLL score (P = 0.005), lower rate of AUDs (P = 0.002), lower rate of AD (P = 0.003) and lower rate of HUA (P = 0.006). Furthermore, the ratio of unrecorded consumption to total consumption was higher in countries with total ban policy compared to those without, though the difference was only close to the level of statistical significance (P = 0.091).

In countries which the alcohol consumption is not banned (n = 50), the level of AD was lower in countries that established NMSs compared to those without these measures, though the difference only approached the level of significance (median (IQR): 1.4 (0.7-2.8) vs. 2.9 (2.1-3.0), P = 0.079); nevertheless, none of other health variables and the rate of abstainers were not significantly different between the countries with and without NMSs.

DISCUSSION

Alcohol use is known as a causal factor for more than 200 disease and injury conditions as described in International Classification of Disease (ICD)-10 (11,12). It is a psychoactive substance with dependence-producing properties (1). Drinking alcohol is greatly linked to risk of developing AD, liver cirrhosis, ischemic heart diseases, cancers and various injuries (most commonly road accidents) (11,12). Since 2010, WHO has endorsed a global strategy which encompasses prevention and reduction of the alcohol consumption as a public health priority (7). One of the main objectives of this strategy is to provide improved systems for monitoring and surveillance at different levels within the member states (7). This results in a better understanding of the situation of use and related disorders in each country in order to provide health authorities with adequate information for drawing an enhanced road map. Most AP countries are still at the very first beginning of development of their own national action plan and implementation of measures to tackle this problem. Hence, it is unsurprising that two-third of the countries in this region did not establish comprehensive NMSs. As a result of this neglect, gathering exact data and analysis of the situation may also greatly suffer. Therefore, in this first analysis on the profile of alcohol use and the status of alcohol related disorders in AP countries, we sought to clarify the situation.

Table 2. Comparison of alcohol consumption and alcohol-related health variables between countries with and without total ban policy (N = 57)

Variables	Total Ban Policy		P value
	Yes	No	
Total consumption (L/Capita)	0.9 (0.3-1.2)	3.2 (1.4-6.5)	0.003
Ratio of unrecorded consumption to total consumption (%)	50.0 (33.3-100)	33.3 (16.4-60)	0.091
Alcohol abstainers (%)	94.2 (91.0-95.9)	68.6 (56.0-90.4)	0.002
HED (%)	0.1 (0.1-0.4)	2.2 (0.2-9.8)	0.003
AAF (%)	0.7 (0.5-1.3)	2.9 (1.6-5.3)	0.001
YLL score	1.0 (1.0-1.0)	2.5 (1.3-4.0)	0.005
AUD (%)	0.3 (0.3-1.8)	3.9 (0.9-4.7)	0.002
AD (%)	0.2 (0.2-0.8)	2.3 (0.7-3.0)	0.003
HUA (%)	0.1 (0.1-1.0)	1.7 (0.4-1.7)	0.006

The status of alcohol consumption and related disorders

In this study, we found that alcohol consumption has been relatively unchanged during 2003 to 2010 in most AP countries, while it increased in one fourth of the countries. During 2008 to 2010, alcohol consumption in AP countries averaged on 3.5 ± 3.1 liter per capita which was approximately 40% lower than the average global consumption (6.2 L per capita) (1). Nevertheless, in 13 countries which were mostly located in South-east Asia and the Pacific region, APC was higher than average global consumption. Accordingly, in the recent WHO report on alcohol (1), countries in the South-east Asian and Western Pacific Regions were introduced as having an increasing trend in alcohol consumption. Yet, alcohol consumption in most AP countries is estimated to be low and very low, which in part can be due to cultural and religious reasons as well as complete ban policies in some countries; however, these estimates are based on the approximate data on alcohol use in these countries, possibly due to the same reasons, and so might be far from the exact situation. To put it in other words, in the absence of official statistics, APC in some Asian countries, especially in the Middle East region e.g. Iran, Kuwait and Afghanistan, is mostly estimated according to unrecorded consumption and so there is a chance that the exact consumption is higher. In addition, in some of the alcohol-banned countries, consumption of locally unlicensed brewed alcohols causes great number of irreversible morbidities and unrecorded deaths (1).

In the present analysis, higher APC was observed in higher income countries. Furthermore, all health variables including HED, AAF, YLL score, AUDs, AD and HUA were significantly higher in countries with higher APC. This is somehow on the contrary to the claim that low-income countries have a higher relative burden of alcohol related disorders than high-income countries (13). In this respect, it can be inferred that the most important factor for causing higher alcohol related burden of disease is the APC itself not the economic status of a country.

Irregular patterns

Although in this study significant associations between level of alcohol consumption and rate of morbidities and mortalities were found, the situation in some countries does not comply with these general trends. For example, despite being Australia and New Zealand among the top countries with the highest alcohol consumption, these countries ranked in the middle of the ranking of AUDs rate. This can be due to effective intervention policies on taxation, marketing, drink-driving, the drinking environment, educational programs and high-risk groups implemented in both countries (14). On the other hand, in Kyrgyzstan, Turkmenistan and Uzbekistan, although the level of alcohol consumption can be classified as lower middle (around 4.5 L/capita); these countries are ranked among the top countries with the highest rate of AUDs. In this regard, it has been ascertained that in countries with limited resources, inadequate harm reduction policies and unequal access to treatments for alcohol disorders, the health and social consequences of a given level or pattern of drinking are also likely to be more severe (1,15,16). Moreover, in Qatar, and United Arab Emirates which are ranked among the countries with the lowest rate of AUDs, AAF is unexpectedly high (Table 1). This, in other words, shows that although the rate of AUDs is low, they are responsible for a good proportion of diseases and deaths in both countries. This might be partly due to the absence of monitoring policies and lack of harm reduction programs in these countries (1). It seems that the harm reduction programs should be evaluated and strengthened in both countries. Similarly, for Japan that faces a high rate of HED despite a medium level of alcohol consumption and medium rate of AUDs, an effective educational program for raising awareness against binge drinking seems necessary.

Impacts of national policies

In this study, we found that higher income countries implemented better data registry for alcohol consumption as they had relatively lower ratio of unrecorded consumption to total consumption compared with lower income countries. This further shows the role and importance of governmental supports in maintaining the global strategy against alcohol and providing more accurate data on the issue (17,18). The necessity of taking action against detrimental effects of alcohol consumption had been neglected in most countries until the beginning of the recent century (19). Since then policies and measures to tackle this problem have been proposed and implemented. Started by higher income countries, developing countries also inclined to compose their own action plan and national document to limit alcohol consumption and to restrain its related disorders. In Iran, for example, the first national alcohol policy document has been ratified since 2013 (20,21). From then on, harm reduction programs such as alcohol dependency rehabilitation centers have been established across the country, and last year, the first Iranian congress on alcohol abuse and related disorders was held and received massive media attention in Iran and worldwide (21).

In this study, we found that total ban policy was effective in lowering the APC, HED, AAF, YLL score, AUDs, AD and HUA. At the same time, NMSs were only effective on relative reduction of AD (Table 3). There are several ways of looking at this matter. First, in countries without NMSs, related data on alcohol consumption and health related variables are underreported and consequently the exact situation is not available, and thus it may not be reasonable to compare their statistics with countries with established NMSs. Second, NMSs may have been mostly effective on the raising awareness in preventing the populations from addictive behaviors on alcohol consumption. This is in consistent with the findings of Anderson et al that showed effectiveness of global policies focused on cognitive-behavioral therapies for AD (17). Third, in the majority of countries, NMSs are still young and thus more time is needed to see their effects on alcohol consumption and related disorders. In addition to being young, these policies need to be supported by governments, a fact that is a weakness in low and middle income countries (6). In this respect, role of media, electronic and print, in promoting alcohol prevention programs should receive high priority.

Finally, as in younger populations we saw better status of alcohol related health indicators (lower APC, AAF and YLL

Table 3. Comparison of alcohol consumption and alcohol-related health variables between countries with and without national monitoring systems in countries without total ban policy (N = 50)

Variables	National monitoring systems		P value
	Yes	No (+ unreported)	
Total consumption	3.3 (1.3-7.2)	4.3 (1.4-6.6)	0.784
Ratio of unrecorded consumption to total consumption	29.0 (14.7-76.9)	35.7 (20.8-60.0)	0.323
Alcohol abstainers	70.3 (54.3-91.9)	61.8 (56.0-75.0)	0.808
HED (%)	2.6 (0.4-9.4)	6.9 (0.8-10.5)	0.743
AAF (%)	2.9 (2.1-6.1)	4.8 (1.2-5.3)	0.693
YLL score	2.5 (2.0-4.8)	3.0 (1.0-4.0)	0.625
AUD (%)	2.8 (0.9-4.8)	4.7 (3.7-4.8)	0.252
AD (%)	1.4 (0.7-2.8)	2.9 (2.1-3.0)	0.079
HUA (%)	1.5 (0.4-1.9)	1.7 (1.4-1.8)	0.474

score and higher rate of abstainers), it can be stated that younger generations are probably more aware and educated about the adverse effects of the alcohol use (as a result of NMSs or other educational programs) compared with older generations. Nonetheless, younger populations are more commonly seen in countries with lower income (and so alcoholic drinks are less affordable) and correspondingly having lower APC. This, in another view, can explain why health indicators are lower in younger societies.

Alcohol and crime

Alcohol use has been recognized as an underlying cause of crime, violence and social disruption (22,23). Alcohol has been reported as a factor in 40% of all violent crimes in the United States (24). Hingson et al reported that 600,000 college students were hit or assaulted by an alcohol drinker peer in the United States (25). The same problem can be observed in developing countries. According to a WHO report on alcohol and drinking problems in low and middle income countries (26), alcohol consumption is directly associated with the rate of crimes, violence, road accidents and intra-family violence including child abuse in Sri Lanka. In India, 50% of male drinkers and 40% of female drinkers in a specific sample stated that they became more aggressive towards other people after drinking (26). Besides, alcohol drinking is one the common substances implicated in poly-drug use in different parts of the world (27). It is usually taken with various illicit drugs such as opioids, cannabis and cocaine. This is highly lethal, as for example in some countries mixing alcohol and cocaine is on increase and resulted in many deaths (27,28).

CONCLUSION

Alcohol consumption in AP region is comparatively lower than global average. However, the status of some countries in Southeast Asia and Pacific region is alarming and needs serious attention to restrain the increase in use and the related disorders. Moreover, establishment of comprehensive NMSs, proper data registry and holistic harm reduction and rehabilitation programs for users should receive meaningful governmental and public support.

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