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The epidemiological profile of alcohol and other drug use in metropolitan China

Hui Cheng · Sing Lee · Adley Tsang · Yueqin Huang · Zhaorui Liu · James C. Anthony · Ronald C. Kessler

Abstract

Purpose There is evidence that alcohol, tobacco, and other drug use may be rising in China, but epidemiological studies that examine several drugs simultaneously and the transition from initial try to current use are limited. The present study provides an epidemiological profile of drug use in contemporary metropolitan China.

Methods A multistage probability sampling method was used to select household-dwelling adults in Beijing and Shanghai. Standard face-to-face interviews with 5,201 participants were completed during 2002–2003.

Results An estimated 70–76% had used any type of drug: alcohol and tobacco were the most commonly used drugs (alcohol, 67%; tobacco, 39%). Regarding extra-medical use of internationally regulated drugs, sedatives and analgesics were most common and illegal drug use was rare. The majority of tobacco users used it recently (82.5%), especially young adults. Male–female differences were observed in lifetime tobacco use, but not for recent use. Concurrent use of alcohol and tobacco was very common.

Conclusion Psychoactive drug use is common in metropolitan China. Public health policies and prevention initiatives may be needed to address associated problems that may increase following the country's rapid socioeconomic change.

Keywords Substance use · Epidemiology · China · Alcohol · Tobacco

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Introduction

The use of psychoactive drugs is not new in China. Historically, it was primarily opium that put extra-medical drug use on the national policy agenda in China, and its recorded use dates back at least 1,000 years (Lindesmith 1965), reaching its height during the Opium War (1839–1842) when China was forced to import opium from Britain (Beeching 1975). Up until the founding of the People's Republic of China in 1949, a large number of Chinese people still engaged in opium use. A radical drug prohibition campaign led by the Chinese government virtually eradicated this practice by the end of 1952 (Yang and Liu 2005).

The situation for alcohol and tobacco is different. The earliest evidence of alcohol use in China can be traced back to approximately 7000 BC via modern discovery of a wine jar in the village of Jiahu in Henan province (McGovern 2003). Alcohol use has become integrated deeply into the Chinese culture. Regular alcohol consumption as well as binge drinking patterns are accepted in a variety of social circumstances and the public often neglects the harm that alcohol can induce.

The history of tobacco use is at least 400 years old in China. Indeed, tobacco smoking has been considered a normative interpersonal behavior and a key element of social life (Hao et al. 1995; Yang et al. 1999). In consequence, China has one of the highest prevalence values for smoking in the world (Mackay and Eriksen 2002). In China, each year's death toll due to tobacco smoking is predicted to rise from the current 750,000 deaths to 2,000,000 deaths by 2030, making China the leading country in terms of tobacco-attributable mortality (Niu et al. 1998).

Various Chinese studies have suggested that alcohol, tobacco and other drug problems are on the rise, especially in the urban parts of China. This may represent one of the first signs of worsening mental health in tandem with China's increasing prosperity (Hao et al. 1995; Yang et al. 1999; Cai 1998; Zhou et al. 2006; Jiafang et al. 2004; Liu et al. 2006). However, the studies that have documented these trends suffer from methodological problems including limitations in the sampling plans and a focus upon just one drug at a time.

Based on recently completed population surveys in two of the biggest cities in mainland China (namely, Beijing and Shanghai), the present study aims are: (1) to estimate the prevalence proportions for the lifetime history and past-year history of tobacco and alcohol use, as well as extra-medical use of a spectrum of psychoactive drugs (including the internationally regulated drugs), (2) to characterize the subgroup of people who were more or less likely to use drugs, (3) to estimate the proportion who continue to use after the initial try, and (4) to explore patterns of multiple drug use with a focus on use of just one drug versus use of multiple drugs.

Methods

The World Mental Health Survey (WMHS) Initiative has included two population-based epidemiological surveys in mainland China (hereinafter abbreviated as WMH-mC). Via these surveys, the WMH-mC research group sought to estimate the prevalence and correlates of mental and behavioral disorders via standardized interviews. Details of the methodology and sample of WMH-mC and WMHS are available elsewhere (Shen et al. 2006; Demyttenaere et al. 2004).

Sample

A stratified multistage clustered area probability sampling method was used to designate household-dwelling non-institutionalized adults aged 18 years and older, in each of the pre-selected metropolitan cities in China: Beijing and

Shanghai. Among Beijing's designated respondents (DR) 2,633 agreed to participate (75%); among Shanghai's designated respondents (DR) 2,568 agreed to do so (75%). These 5,201 DR were assessed via face-to-face interviews conducted by trained lay interviewers between November 2001 and February 2002. All DR were informed about the study and provided written informed consent prior to these interviews.

The diagnostic assessment was administered in two parts. A core diagnostic assessment ("Part I") included standardized modules to assess history of alcohol beverage consumption and related problems. "Part II" of the assessment was used to measure suspected correlates or determinates, as well as additional topics including tobacco use and extra-medical psychoactive drug use. Part II was administered to 100% of part I respondents who had a history of other disorders (as detected via Part I modules), plus a 25% sub-sample of all other participants. A conventional survey weighting procedure was used to take into account the varying sample weights and PartI/II selection probabilities during the study's estimation steps.

Measures

At the core of the WMH-mC assessment protocol is a Chinese version of the World Mental Health Initiative's adaptation of the World Health Organization Composite International Diagnostic Interview (WMH-CIDI; Kessler and Ustun 2004), a comprehensive, fully structured diagnostic interview schedule of standardized multi-item modules, designed to be administered by trained lay interviewers. The Chinese WMH-CIDI for the WMH-mC was refined via iterative translation, back translation and harmonization, as conducted by panels of bilingual experts.

The psychoactive drugs assessed via the WMH-mC included alcohol, tobacco (including cigarette, cigar, or pipe), sedatives, stimulants, analgesics, cannabis (marijuana, hashish), cocaine and other psychoactive drugs (a general category that included heroin, glue, opium, etc.) used for extra-medical reasons. Standardized items in the Part I modules assessed lifetime experience with ethanol-containing beverages (hereinafter, "alcohol"), as well as tobacco. Standardized Part II items assessed lifetime experience with the other drug compounds. When DR reported any lifetime history of use, standardized items then were asked about recent use (in the prior 12 months). Although lifetime tobacco use is assessed via a Part I item of the WMH-CIDI, recent use of tobacco is assessed via a Part II item.

Covariates of special interest here were personal characteristics such as sex, age, marital status (currently married or cohabitating, never married, or no longer married), year of education (no more than 6 years, or more

than 6 years), employment status (working, student, homemaker, retired, or other), and levels of income (low, low-average, high-average, or high); all were assessed via standardized items.

Analysis

In the initial data analysis step, via unweighted and then weighted calculations, we quantified the number of cases and the lifetime history of drug use, drug by drug. We then estimated the proportion with recently active drug use among individuals who had initiated drug use, drug by drug. In the results, we display unweighted numbers as well as epidemiological estimates for the lifetime history and recency of alcohol, tobacco and other drug use. The lifetime history is estimated in the traditional way, as the proportion of individuals who ever used a drug. [This proportion serves as an estimate of the cumulative incidence proportion among survivors (CIPAS), sometimes called "lifetime prevalence."] Recently active drug use is estimated by prevalence of use within 12 months prior to assessment. In a subsequent step, these estimates were calculated for time-invariant (e.g., "demographic") characteristics such as sex, age, as well as some potentially modifiable time-varying characteristics: employment status, marital status, education and income. For both time-invariant and modifiable characteristics, the generalized linear model with a logit-link function (logistic regression) was used. Estimates are presented in the form of odds ratio as an index of the strength of associations. Initial bivariate associations (and 95% confidence interval, CI) are reported, followed by estimates from multiple logistic regression. In these analyses, variance estimation involved a Taylor Series Linearization approach, with due attention to variation in sample selection probabilities (including Part I/II probabilities), post-stratification adjustment factors, and the nested strata created as part of the multistage probability sampling procedures. The 95% CI are presented in order to gauge the statistical precision of the study estimates. Stata software (version 9.0) was used for these analyses.

Results

Lifetime history of drug use and past-year prevalence among people who had initiated drug use

As shown in Table 1, among the drugs studied in WMH-mC, drinking alcohol has become the most common form of psychoactive drug use in the population (67% with a lifetime history of use), followed by tobacco (39% lifetime history). With respect to other drugs under study, no more than about one in 20 (5.4% lifetime history) has consumed these drugs for extra-medical reasons. Among prescription drugs used extra-medically, the 'sedative' drug compounds had become the most commonly used class of compounds (3.6% lifetime history), followed by analgesics (2.3% lifetime history). The extra-medical use of stimulants and illegal drugs such as cannabis was too rare to estimate with any precision.

As for recency of use, an estimated 83% of lifetime tobacco users had used tobacco during the year prior to the assessment. Approximately 40% of lifetime alcohol users had used alcohol during the year prior to assessment. Corresponding estimates were 35% for extra-medical sedative drug use, and 21% for extra-medical analgesic drug use (Table 1).

Associations of socio-demographic variables with lifetime use, and with recently active use among lifetime users

With respect to lifetime history of alcohol use, males were more likely to have initiated use, as compared to females (adjusted odds ratios, OR = 2.8, 95% CI 2.1, 3.7; Table 2). Age was not strongly associated with lifetime alcohol use. Respondents who were no longer married (adjusted OR = 2.2, 95% CI 1.3, 3.8) and those who had achieved six or more years of education (adjusted OR = 1.6, 95% CI 1.1, 2.5) were more likely to have initiated alcohol use as compared to others. Students were less likely to have initiated alcohol use compared to other employment groups (adjusted OR = 0.4, 95% CI 0.2, 0.99). With respect to recency of alcohol use among people who had initiated alcohol use, males were more likely to have used alcohol in the year prior to the assessment as compared to females (adjusted OR = 6.9, 95% CI 3.8, 12.6). Age was not strongly associated with recent active alcohol use. Higher income (adjusted OR = 1.9, 95% CI 1.0, 3.5) and being married or cohabiting (adjusted OR = 1.8, 95% CI 0.99–3.2) was associated with recent active alcohol use among lifetime users, respectively.

With respect to lifetime history of tobacco use, males (67%) were more likely to have initiated tobacco use as compared to females (7%, adjusted OR = 42.7, 95% CI 25.1, 72.5; Table 3). Lifetime history of tobacco smoking was lower in older age groups (50–64 years old, and 65 years old and above) as compared to younger groups. Compared with individuals who were working, students were less likely to have initiated tobacco use (adjusted OR = 0.1, 95% CI 0.0, 0.3), and homemakers were more likely to have initiated tobacco use (adjusted OR = 7.4, 95% CI 1.6, 34.0). Compared with individuals with low-average income, people with higher income were less likely to have initiated tobacco use.

Table 1 Estimated lifetime history of psychoactive drug use, as well as estimated past-year prevalence of use among lifetime users

	n	Estimated lifetime history (weighted %)[d]	95% CI	Past-year prevalence among lifetime users (weighted %)[d]	95% CI
Alcohol[a]	5,201	67.3	64.9, 69.7	42.0	39.6, 44.4
Tobacco	5,201	38.7	36.7, 40.7	82.5	77.6, 86.5
Sedatives	1,628	3.6	2.4, 5.2	34.5	21.7, 50.2
Stimulants	1,628	4/1,628[c]		2/4[c]	
Analgesics	1,628	2.3	1.4, 3.7	21.1	14.2, 28.0
Cannabis	1,628	0.3	0.1, 0.6	1/5[c]	
Cocaine	1,628	0		0	
Other drugs[b]	1,628	2/1,628[c]		0	

Data from 2001–2002 World Mental Health-metropolitan China

[a] Recent active use of alcohol was defined as at least once per month in the past 12 months

[b] Included heroin, opium, LSD, inhalants, peyote

[c] Due to the small numbers, the prevalence estimate was not statistically robust; the raw numbers have been presented for illustrative purposes

[d] Weights were (a) the inverse of sample selection probabilities and (b) post-stratification adjustment factors that take into account individual-level variations in sampling probabilities as well as survey non-response patterns. The use of these weights in probability sample surveys is conventional practice in public health research (Kalsbeek and Heiss 2000)

With respect to recently active tobacco use, despite the considerable male–female difference in lifetime history of tobacco use, past-year use of tobacco among lifetime smokers was virtually the same for males (81%) and females (83%). Smokers in the youngest group (18–34 years old) showed elevated likelihood of recently active tobacco smoking (adjusted OR = 3.1, 95% CI = 1.07, 8.93). Students and individuals who were retired were less likely to smoke tobacco in the year prior to the assessment as compared to people who were working.

With respect to extra-medical drug use, sex and age were not significantly associated with either lifetime history or recency of extra-medical drug use ($p > 0.05$). Individuals who were married (adjusted OR = 9.4; 95% CI 2.7, 32.3) and who were no longer married (adjusted OR = 12.6; 95% CI 2.9, 55.6) were more likely to have initiated extra-medical use than those who had never been married. In contrast, with respect to recency, among lifetime extra-medical drug users, individuals who were married were no more likely to use drug extra-medically in the year prior to the assessment than those who had never been married (OR = 0.2, $p > 0.05$). Individuals who were no longer married were less likely to use drugs extra-medically (OR = 0.1; 95% CI <0.1, 0.7) as compared to those who had never been married. Income level and occupation were not robustly associated with extra-medical drug use in this study ($p > 0.05$).

Pattern of multiple drug use

Tables 4 and 5 illustrate patterns of multi-drug use among lifetime users and recently active use among lifetime users,

respectively. Overall, there is a subgroup of persons who had initiated alcohol only and a subgroup who had initiated both alcohol and tobacco, accounting jointly for 61% of all persons, whereas about 1 in 4 persons had not initiated any of the drugs (27%). The majority (77%) of lifetime tobacco users had used alcohol. In contrast, the most common patterns in lifetime alcohol users were alcohol only (46%), and both alcohol and tobacco (47%). Among lifetime extra-medical users of internationally regulated drugs, the largest proportion consisted of multi-drug users of alcohol, tobacco, and extra-medical drugs (41%).

With respect to recently active use, 37.7% lifetime users did not use any type of drug under study during the year prior to the assessment. Tobacco only and tobacco plus alcohol were the two most common patterns of recently active use. Almost half of tobacco users (47%) used only tobacco during the past 12 months, while 37% of alcohol users used only alcohol during the past 12 months. Among extra-medical drug users, the largest group consisted of those using extra-medical drugs only (i.e., with no concurrent alcohol or tobacco use).

Discussion

Limitations of study

Several limitations should be noted. First, given that China still is about 70% rural and because its urban areas are possibly heterogeneous, our findings cannot be generalized to other parts of the country beyond Beijing and Shanghai. Second, deficiencies in recall could have led to

Table 2 Alcohol: estimated associations of background variables with lifetime history of drinking and with recently active drinking among drinkers

	Lifetime history						Recently active drinking among drinkers				
	n	%[d]	uOR	95% CI	aOR	95% CI[a,c]	%[d]	uOR	95% CI	aOR	95% CI[a,c]
Sex											
Female	2,668	54	1.0		1.0		16		1.0		1.0
Male	2,533	79	3.1	2.6, 3.7	**2.8**	**2.1, 3.7**	58	7.3	5.9, 9.0	**6.9**	**3.8, 12.6**
Age (years)											
18–34	1,209	71	1.0		1.0		35	0.6	0.5, 0.7	0.9	0.6, 1.5
35–49	2,261	70	1.0	0.8, 1.3	0.9	0.5, 1.5	48		1.0	1.0	
50–64	1,184	60	0.6	0.5, 0.8	0.7	0.3, 1.4	40	0.7	0.6, 0.9	0.6	0.3, 1.1
65+	547	49	0.4	0.3, 0.5	0.5	0.2, 1.1	45	0.9	0.6, 1.2	0.5	0.2, 1.3
Marital status											
Married/cohabitating	4,035	66	1.0		1.0		44	1.5	1.2, 1.9	1.8	1.0, 3.2
No longer married	318	65	0.9	0.7, 1.2	**2.2**	**1.3, 3.8**	40	1.3	0.9, 1.8	1.5	0.6, 3.9
Never married	848	69	1.2	0.9, 1.5	1.0	0.6, 1.8	35	1.0		1.0	
Education (years)[a]											
≤6	168	46	1.0		1.0		40	1.0		1.0	
>6	1,460	68	2.6	1.7, 3.8	**1.6**	**1.1, 2.5**	43	1.1	0.6, 2.0	0.5	0.2, 1.5
Employment											
Working	2,922	73	1.0		1.0		45	1.0		1.0	
Student	241	61	0.6	0.4, 0.9	**0.4**	**0.2, 1.0**	20	0.3	0.2, 0.5	0.5	0.2, 1.5
Homemaker	56	34	0.2	0.1, 0.4	1.0	0.3, 3.3	8	0.1	0.0, 0.5	1.1	0.1, 12.1
Retired	1,381	51	0.4	0.3, 0.5	0.8	0.5, 1.3	33	0.6	0.5, 0.7	0.8	0.4, 1.4
Other	601	71	0.9	0.7, 1.2	0.8	0.4, 1.4	47	1.1	0.9, 1.4	0.9	0.4, 1.8
Income[a,b]											
Low	247	62	1.0		1.0		36	1.0		1.0	
Low-average	433	63	1.1	0.6, 1.8	1.1	0.6, 2.0	41	1.2	0.6, 2.3	1.4	0.7, 2.7
High-average	588	68	1.4	0.8, 2.2	1.3	0.8, 2.4	45	1.5	0.9, 2.5	1.3	0.7, 2.5
High	360	68	1.3	0.7, 2.5	1.3	0.6, 2.7	48	1.6	0.9, 3.00	**1.9**	**1.0, 3.5**

Data from 2001–2002 World Mental Health-metropolitan China

aOR adjusted odds ratios, uOR unadjusted odds ratio

[a] Estimates are based upon part II sample ($n = 1,628$)

[b] Based upon WMHS categories

[c] Adjusted OR from multiple regression models including all background variables examined here. Numbers are in bold when $p < 0.05$

[d] Weighted, as described in the footnote to Table 1

underestimation of lifetime history estimates and to possibly biased estimates of socio-demographic correlates. Third, the assessment of drug use is based on self-report, the validity of which might be expected to vary across drugs (e.g., illegal vs. socially accepted drugs such as alcohol and tobacco). Although Darke suggested that self-report is an acceptable method to assess illegal drug use in Western communities, use of illegal drugs is highly stigmatized and dealt with predominantly as a criminal problem in China (Darke 1998). We are not aware of any study that has assessed the validity of self-reported illegal drug use in China, but under-reporting could have contributed to the very low estimates in this survey. Finally, we only studied adults, even though drug use in adolescents

is a matter of global concern (Mackay and Eriksen 2002; Jernigan 2001).

Findings in the Chinese context

Drug use was found to be common in metropolitan China, with the majority of people (73.4%) having a history of using at least one drug during their lifetime. Although sampling and other methodological differences precluded direct comparison of estimates of drug use, our findings were generally congruent with previous Chinese studies in showing that the most commonly used drugs are alcohol and tobacco, while extra-medical use of internationally regulated drugs primarily involved sedatives and analgesics

Table 3 Tobacco: estimated associations of background variables with lifetime history of smoking and with recently active smoking among smokers

	Lifetime history						Tobacco: recently active smoking among smokers[a]				
	n	%[d]	uOR	95% CI	aOR	95% CI[a,c]	%[d]	uOR	95% CI	aOR	95% CI[c]
Sex											
Female	2,668	7	1.0		1.0		81		1.0	1.0	
Male	2,533	67	26.7	21.6, 33.0	**42.7**	**25.1, 72.5**	83	1.1	0.4, 3.2	0.6	0.2, 1.6
Age (years)											
18–34	1,209	32	0.5	0.3, 0.8	0.8	0.5, 1.4	93	1.6	0.5, 4.6	**3.1**	**1.1, 8.9**
35–49	2,261	46	1.0		1.0		89		1.0	1.0	
50–64	1,184	38	0.8	0.5, 1.1	**0.5**	**0.3, 0.8**	67	0.3	0.1, 0.5	0.5	0.2, 1.1
65+	547	41	0.5	0.3, 0.9	**0.3**	**0.1, 0.6**	49	0.1	0.1, 0.3	0.4	0.1, 1.5
Marital status											
Married/cohabitating	4,035	42	1.6	1.0, 2.5	**2.4**	**1.2, 4.7**	80	0.4	0.2, 1.1	1.6	0.6, 4.3
No longer married	318	38	1.3	0.7, 2.5	**3.5**	**1.4, 8.8**	85	0.6	0.2, 1.9	3.0	0.9, 10.1
Never married	848	30	1.0		1.0		91	1.0		1.0	
Education[a]											
≤6 years	168	33	1.0		1.0		60	1.0		1.0	
>6 years	1,460	41	1.4	0.9, 2.2	0.8	0.5, 1.6	85	3.7	1.8, 7.6	1.0	0.5, 2.4
Employment											
Working	2,922	43	1.0		1.0		91	1.0		1.0	
Student	241	6	0.1	0.1, 0.2	**0.1**	**0.0, 0.3**	47	0.1	0.0, 0.9	**0.0**	**0.0, 0.6**
Homemaker	56	14	0.2	0.1, 0.4	**7.4**	**1.6, 34.0**	85	0.5	0.1, 2.1	0.6	0.1, 3.6
Retired	1,381	30	0.6	0.5, 0.7	**1.9**	**1.0, 3.4**	53	0.1	0.1, 0.2	**0.2**	**0.1, 0.6**
Other	601	53	1.5	1.2, 1.9	**2.6**	**1.3, 5.4**	87	0.7	0.3, 1.8	0.7	0.2, 2.5
Income[a,b]											
Low	247	42	1.0	0.7, 1.5	0.7	0.4, 1.2	78	0.6	0.2, 1.7	0.5	0.2, 1.3
Low-average	433	42	1.0		1.0		85	1.0		1.0	
High-average	588	41	1.0	0.7, 1.3	**0.5**	**0.3, 0.8**	82	0.8	0.4, 1.9	0.8	0.4, 1.8
High	360	34	0.7	0.5, 1.2	**0.4**	**0.2, 0.6**	82	0.8	0.3, 2.1	0.5	0.2, 1.4

Data from 2001–2002 World Mental Health-metropolitan China

[a] Estimates are based upon part II sample

[b] Based upon WMHS categories

[c] Adjusted OR from multiple regression models including all background variables examined here. Numbers are in bold when $p < 0.05$

[d] Weighted, as described in the footnote to Table 1

(Hao et al. 1995; Yang et al. 1999; Zhang et al. 2004; Zhao et al. 2004). We found that many people used both alcohol and tobacco; the pattern of lifetime history of drug use was different from that of continuing drug use (recent use among lifetime users). The observed pattern of multi-drug use conveyed important messages for future drug control. First, the majority (62.3%) of lifetime users continued to use drug. Second, there is a variety of use patterns among different drug users. For example, although alcohol was the most common drug in lifetime use, only 14.4% of lifetime users consumed it during the previous year. In contrast, most of the lifetime tobacco users had smoked it during the previous year. This finding reflects the reinforcing effects of nicotine and tobacco smoking generally (Anthony et al. 1994; Richard et al. 2007) and is congruent with results

from the 1996 national smoking prevalence survey in China which showed that 90% of smokers continued smoking or had tried to quit without success (Yang et al. 1999, 2000). Third, since extra-medical use of internationally regulated drugs was uncommon and the majority of past-year users used extra-medical drugs only, they represent a different population subgroup that might merit special outreach and early intervention programs in China.

Male–female differences were most prominent in relation to lifetime tobacco use. The overall male–female difference in lifetime tobacco use was smaller than has been found in previous Chinese studies (e.g., 66.9% in males versus 4.2% in females in the 1996 national smoking prevalence survey; 67 vs. 2% in the Minhang district study; 50.3% in males vs. 5.1% in females in the Huaihua study)

Table 4 Lifetime history of types of drugs ever used

Drug types	All persons (n = 1,628)			Tobacco users (n = 893)		Alcohol users (n = 1,063)		Other drug[c] users (n = 138)	
	n	%[a]	95% CI	%[a]	95% CI	%[a]	95% CI	%[a]	95% CI
Alcohol only	455	30.2	27.2, 33.4			46.2	42.3, 50.0		
Tobacco only	107	6.5	4.9, 8.6	16	13, 21				
Other drugs only	30	1.1	0.5, 2.4					20	10, 35
Alcohol + tobacco	510	30.9	28.0, 34.0	77	72, 81	47.3	43.3, 51.2		
Alcohol + other drugs	50	1.9	1.3, 2.6			2.8	2.1, 3.9	32	22, 43
Tobacco + other drugs	10	0.4	0.2, 0.8	1[b]				7	3, 13
Alcohol + tobacco + other drugs	44	2.4	1.4, 3.9	6	4, 10	3.6	2.2, 6.0	41	28, 54
None	417	26.6	23.6, 29.9						
Unknown	5[b]					3/1,063[b]		2/138[b]	

Data from 2001–2002 World Mental Health-metropolitan China

[a] Weighted. Does not sum to 100.0% due to rounding

[b] Due to the small numbers, the prevalence estimate was not statistically robust; the raw numbers have been presented for illustrative purposes

[c] All other drugs assessed except for alcohol and tobacco

Table 5 Types of drugs used during the past year among those with a history of any drug use

Drug types	Among lifetime users (n = 1,207)			Among tobacco users (n = 551)		Among alcohol users (n = 483)		Among other drug users (n = 48)	
	n	%[a]	95% CI	%[a]	95% CI	%[a]	95% CI	%[a]	95% CI
Alcohol only	163	14	12, 17			37	31, 44		
Tobacco only	230	21	18, 25	47	40, 54				
Other drugs only	27	2	1, 3					46	28, 65
Alcohol + tobacco	306	23	19, 27	51	44, 58	59	52, 66		
Alcohol + other drugs	6[d]					1[d]		5	2, 14
Tobacco + other drugs	7[d]			1[d]				10	4, 24
Alcohol + tobacco + other drugs	8[d]			1[d]		1[d]		7	3, 16
None	442	38	34, 42						
Unknown	18	1	1, 3	1[d]		3	1, 6	32	19, 49

Data from 2001–2002 World Mental Health-metropolitan China

[a] Weighted. Does not sum to 100.0% due to rounding

[c] All other drugs assessed except for alcohol and tobacco

[d] Due to the small numbers, the prevalence estimate was not statistically robust; the raw numbers have been presented for illustrative purposes

(Yang et al. 1999, 2000; Zhou et al. 2006; Gong et al. 1995). However, once smoking started, female smokers were as likely to smoke tobacco recently as their male counterparts, consistent with results of the 1996 national smoking prevalence survey (Yang et al. 1999). The larger tobacco-smoking prevalence estimates in this study may forecast a trend for future convergence of male–female prevalence of tobacco smoking in China, and signals a need to include females in outreach, early interventions, and prevention programs.

In contrast to the tobacco use findings, the male–female difference in alcohol use was more prominent in past-year use than in lifetime use. This suggests a difference in mechanisms underlying tobacco use and alcohol use. Such mechanisms are likely to be complex, involving both biological and psychosocial origins (Finn and Gee 1993; Lancaster and Spiegel 1992).

With respect to the age profile of drug users, it is noteworthy that the estimated prevalence of past-year tobacco use was higher in the youngest group of tobacco users, while there was no such a pattern in alcohol use and extra-medical drug use. This finding calls for pre-adult prevention programs as well as early intervention for young adult tobacco smoking, which can be an especially modifiable determinant of later health consequences (Murray and Lopez 1997).

With respect to marital status, lifetime extra-medical drug use was more common in ever-married people, while recent use was more common in never-married users. The result is similar to what was found in the US. Its significance requires further research (Degenhardt et al. 2007).

Cross-national comparison

The standardized WMH study protocol facilitates comparison among participating countries. The cross-national variation in drug use was substantial. For example, alcohol use and tobacco use were more common in metropolitan China than in Nigeria (Gureje et al. 2007), but less common than in the US. Extra-medical including illegal use of internationally regulated drugs has been found to be much less common in metropolitan China than in the other countries participating in the WMHS (Degenhardt et al. 2007; Gureje et al. 2007; Medina-Mora et al. 2006). There is a background context that might account for the observed low prevalence of extra-medical drug use in China. First, illegal drug use exhibits large geographical heterogeneity within China and is most common in areas along the so-called "China Channel" of drug smuggling, which stretches from the Chinese border of the Golden Triangle (where eastern Myanmar, northwestern Laos and northern Thailand meet) to the southwestern provinces (Zhou et al. 2006; Hao et al. 2002; Hao et al. 2004). The sites in our study were outside of these areas. Second, as mentioned above, the greater stigma attached to extra-medical drug use, including illegal drug use, may have led to under-participation and under-reporting by such drug users, as well as refused to answer questions on these topics. This is especially so for illegal drug use, which is understood in criminal terms in China, and not in a public health context.

There are cross-national similarities as well as differences in the socio-demographic profiles of drug users. For example, the male–female difference in tobacco use in the present study was similar to that of Nigeria but much larger than is found in the US (Degenhardt et al. 2007; Gureje et al. 2007; Medina-Mora et al. 2006). That youngest adults were the least likely to quit smoking also has been found in the US (Degenhardt et al. 2007).

Implications and directions for future research

Tobacco use and alcohol use are at the top of the list of determinants of the global disease burden (Murray and Lopez 1997). Our study indicates that use of tobacco and alcohol are widespread in two highly developed cities in China. Moreover, the rapid modernization and growing prosperity of China may put several groups of people at increasing risk for drug use, such as males and young

people including females. Even if our findings are only partially generalizable to other parts of this most populous country in the world, their public health implications are considerable.

Research on drug use in China is also of theoretical interest. For example, according to the four-stage model of tobacco smoking developed by Professor Alan Lopez and colleagues (Lopez et al. 1994), the pattern we found in metropolitan China is compatible with stage two, where male smokers markedly outnumber female smokers. However, if female smoking is increasing, a transition from stage two to stage three may be progressing. Together with the finding that youngest smokers were most likely to continue tobacco smoking, this calls for vigorous intervention to reduce the transition of tobacco use to more advanced stages that are associated with considerable morbidity and mortality. The absence of a male–female difference in continued smoking following an initial try highlights the need for secondary intervention for both males and females, and not just primary prevention.

Our findings also call for research beyond cross-sectional surveys. For example, a gateway process has been described such that there are developmental stages of drug use that start with legal drug use and proceed to illegal drug use (Kandel 1975). This conceptual model has been found to be useful in research on drug use in western communities. Studies examining this type of process in China should help us to understand drug use among the Chinese from a developmental perspective, and may shed light on the complexity of drug use in general. Additionally, the neighborhood clustering approach (Delva et al. 2000; Bobashev and Anthony 1998, 2000; Petronis and Anthony 2000), as well as qualitative research, may be used to illuminate the origins, patterns, and consequences of drug use in China with enhancement of more effective programs for prevention and intervention.

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