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Demographic and Behavioral Factors Associated With HIV Testing in China

Keming Rou, BS[*], **Jihui Guan, MD**[†], **Zunyou Wu, MD, PhD**[*], **Li Li, PhD**[‡], **Mary Jane Rotheram, PhD**[‡], **Roger Detels, MD, MS**[§], **Yi Wen, MD**[§], **Chunqing Lin, MD**[§], and **Haijun Cao, MD**[§]

[*]National Center for AIDS/STD Control Prevention, Chinese Center for Diseases Control and Prevention Beijing, China

[†]Fujian Center for Diseases Control and Prevention Fuzhou, China

[‡]Semel Institute - Center for Community Health, Department of Psychiatry and Biobehavioral Sciences, UCLA David Geffen School of Medicine Los Angeles, CA

[§]Department of Epidemiology, UCLA School of Public Health Los Angeles, CA

To the Editor

HIV testing and counseling are entry points to HIV-related care and prevention services and provide opportunities for people to reduce their risk of acquiring or transmitting HIV. High priority should be given to scaling up HIV testing and counseling to maximize the opportunities to reach those with HIV infection or at high risk.[1] Voluntary counseling and testing (VCT) is an important testing strategy for identifying HIV positives. VCT in China was not widely known and available until December 2003, when the Chinese government announced the "Four Frees and One Care" policy, which included free VCT.[2] We conducted a study among a general population sample rather than a high-risk group, with the collection of both demographic and behavioral data, to examine potential factors associated with VCT uptake in the population.

Participants for this study were recruited from 40 selected food markets in Fuzhou city China. All vendors aged 18–49 years in the selected market were invited to participate in the study. Selected participants were transported by van to the study location for assessment, after the administration of informed consent. The assessment interview was administered in a private place face-to-face with interviewers recording responses on laptop computers. History of HIV testing was measured by asking the question: "have you ever voluntarily had your blood tested for HIV (the virus that causes AIDS) before today?" Demographic characteristics were self-reported age, gender, marital status, education, self-reported discretionary money per month, and health status. Special risk behaviors included the number of sexual partners in the last 6 months; reports of more than 1 partner were considered having multiple partners. Alcohol use was defined as drinking alcohol at least once in the past 30 days. HIV-related stigma was constructed by combining 4 items answered with a Likert-type scale from 1 (strongly disagree) to 5 (strongly agree). All analyses were performed using SAS statistical software version 9.1.3. First, descriptive analyses were performed to illustrate the demographic characteristics of the sample regardless of their voluntary HIV testing status. Only 2.13% (n = 96) of the sample reported having had voluntary HIV testing before the interview. The comparison of participants with a prior history of voluntary HIV testing (n = 96) to those with no history of HIV testing (n = 4414) yielded an unbalanced sample. To address this unbalanced sample comparison, we used a random sampling process to generate a representative sample of 300 of those who reported no history of VCT. The χ^2 or *t* tests were used for bivariate analyses. Multiple logistic regressions were performed to examine associations between VCT uptake and participants' age, gender, education, marital status, alcohol use, multiple sexual partners in the past 6 months,

discretionary money, and self-reported health status and stigmatizing attitude toward people living with HIV/AIDS (PLWHA).

Table 1 summarizes the characteristics of the study population (N = 4510) and subjects having had a history of HIV testing (n = 96). More than half of the participants were women; 44.5% were aged 36 or older; 82.4% were currently married or lived with a partner; and 12.9% had an education level of high school or above. About 5.4% of respondents reported having more than 1 sexual partner during the past 6 months and about 60.0% of the participants reported that they were in a good or excellent health status. The mean of discrimination scale was 3.91 with SD 0.93 (not presented in Table 1). Among the 4510 participants, 96 people reported that they had had VTC before the assessment. Males had a higher rate of uptake of VCT than females ($P < 0.001$), subjects had multiple sexual partners in past 6 months, and subjects who used alcohol at least once in the past 30 days and who self-reported their health status as good or excellent had a higher proportion of having a history of HIV testing ($P < 0.01$) (Table 1).

Comparison of a sample of 300 subjects who had no VCT with 96 subjects who had VCT revealed that male (had VCT vs. not had VCT, 68.8% vs. 47.3%; $P < 0.001$), who had multiple sex partners in the past 6 months (had VCT vs. not had VCT, 12.4% vs.4.4%; $P = 0.008$), using alcohol at least once during the past 30 days (had VCT vs. not had VCT, 59.4 % vs. 36.7%; $P < 0.001$), are significantly associated with VCT uptake. The associations between VCT uptake and age, marital status, education, income, health status, and discriminatory attitude toward people living with HIV/AIDS were not significant.

Controlling for all other variables, multiple logistic regression analyses showed male gender [odds ratio (OR) = 1.82] having more than 1 sexual partner within the past 6 months (OR = 2.73), being married or living with partners (OR = 2.58), and using alcohol (OR = 1.92) were significantly associated with uptake of VCT.

HIV testing is as an important step in detecting, treating, and preventing HIV infection.[3] However, the study results showed that the uptake of voluntary HIV testing among Chinese general population was very low compared with other countries.[4,5] The low prevalence of VCT among the general population in China might be due to a variety of reasons. These include a lower suspicion of having the disease among the general population and the lack of awareness about testing or its availability to the population. The reluctance to be tested may also be related to the denial of being at risk and a lack of comfort in seeking services. A low testing rate has substantial consequences for public health. Without early diagnosis, infected individuals are not able to get appropriate medical treatment. In addition, lack of knowledge of HIV infection status allows HIV-positive individuals who do not know their HIV status to continue to spread the virus to others. The study findings suggest an urgent need to promote VCT among the Chinese general population.

In this study, we found that men were more likely to get HIV tested than their female counterparts after controlling for potential confounders. In China, HIV or sexually transmitted disease in women was associated with a higher level of stigmatization associated with premarital and extramarital sexual activities. [6] This further compromises women's ability to seek HIV or sexually transmitted disease testing and care.[7] Similar difficulties in access VCT services exist for unmarried people whose VCT-seeking process is especially complicated by the stigma associated with premarital and extramarital sexual activities. This makes targeting female and single people for HIV/AIDS health education a priority in public health interventions. Interventions need to be tailored for this population to increase their awareness of HIV risks, reduce misconceptions, and promote HIV testing among the populations.

Risk perception or a sense of vulnerability is assumed to be a motivation for self-protective behaviors, which may include VCT and returning for the results.[8] In this study, having multiple

sexual partners was significantly associated with uptake of HIV testing which is consistent with previous findings. Raising the level of perceived risk and awareness of risk behavior and its relationship to HIV infection should be a strategy to promote VCT.

The finding of alcohol use associated with report of a prior history of voluntary HIV testing suggests that HIV prevention programs may need to emphasize the links between alcohol use, risky behavior, and HIV infection.

There are some limitations that need to be taken into account in interpreting our study findings. First, the study used a cross-sectional design in which VCT might have preceded some behavioral variables in the model. For example, prior negative test results may also have had an impact on risky sexual behavior. Second, discussing sexual behavior is a sensitive topic in China; thus information bias is very hard to avoid. Consequently, the proportion of study participants with multiple sexual partners may likely be higher than that reported in the study, although preventive measures such as extensive trainings of interviewers and administering questionnaires using computer-assisted personal interview (CAPI) were put in place. This bias, however, likely reduced the probability of finding significant association. Third, the data were collected only in 1 geo-graphic location in eastern China. The results might not be generalizable to other areas of China. In addition, the study only surveyed the population of market vendors, and the findings could be very different for people with other occupations residing in the same geographic location.

In conclusion, HIV is spreading rapidly throughout China, but uptake of HIV testing is low among the general population. Culturally appropriate promotion of VCT is vital to control and prevent further spread of HIV. Special attention should go beyond high-risk groups and educate the general population to increase their awareness of the disease and their willingness to seek testing. HIV testing services need to be more accessible and acceptable to everyone.

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Table 1

Description of Study Sample (N = 4510) and Proportion Who Had an HIV Test (n = 96)

	No. Participant	No. Tested	Proportion (%)
Gender			
Male	2132	66	3.10*
Female	2378	30	1.26
Age			
25 or younger	870	14	1.61
26–30	726	18	2.48
31–35	904	24	2.65
36–40	839	20	2.38
40 or older	1171	20	1.71
Marriage status			
Married/living with partner	3717	82	2.21
Never married/single	740	13	1.76
Widow/separated/divorced	53	1	1.88
Education†			
No schooling	379	3	0.79
Primary school	1667	31	1.86
Junior high school	1882	42	2.23
Senior high school	557	20	3.59*
College or above	25	1	3.99
Had multiple sexual partners in the past 6 m			
Yes	223	12	5.32*
No	3881	84	2.17
Alcohol use at least once in the past 30 days			
Yes	1859	57	3.07*
No	2650	39	1.47
Self-reported health status			
Excellent/good	2524	67	3.39
Fair/poor	1986	29	1.63

* $P < 0.01$.

† For comparison of HIV test between education categories, the 3 categories of no schooling, primary school, and Junior high school are combined as 1 category, and 2 categories of senior high school and college or above are combined.