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Impact evaluation of a sexually transmitted disease preventive intervention among female sex workers in Hohhot, China

Yuhui Shi [a,1], Shuyi Guo [b,1], Fubao Bo [c], Xingguang Zhang [d], Wangnan Cao [a], Peiyang Wang [a,*]

[a] Department of Social Medicine and Health Education, School of Public Health, Peking University, Beijing, 100191, China
[b] People's Hospital of Inner Mongolia Autonomous Region, Hohhot, China
[c] Inner Mongolia Center for Disease Control and Prevention, Hohhot, China
[d] Inner Mongolia Medical College, Hohhot, China

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SUMMARY

Objectives: The aim of this study was to evaluate the impact of HIV and sexually transmitted disease (STD) prevention interventions among female sex workers (FSWs) in the city of Hohhot in northern China.

Methods: Three serial cross-sectional surveys were conducted in 2006, 2007, and 2008 among FSWs. A questionnaire was administered to the FSWs, and HIV and syphilis tests were performed for all participants. Intervention activities including condom promotion and provision, increased condom availability and accessibility, and voluntary HIV counseling and testing (VCT) were carried out among FSWs.

Results: There were 624 participants in the 2006 survey, 444 in the 2007 survey, and 451 in the 2008 survey. The United Nations General Assembly Special Session (UNGASS) indicators for FSWs increased from 13.9% in 2006 to 37.7% in 2008 ($p < 0.001$). The average rate of consistent condom use with commercial clients in the month preceding the interview increased significantly from 39.8% in 2006 to 59.6% in 2008 ($p < 0.001$). Not a single HIV-positive case was found among the FSWs over these 3 years, and the prevalence of syphilis decreased remarkably from 9.5% in 2006 to 1.3% in 2008. Logistic regression analysis showed that sauna or hair salon work venues, receiving services from intervention programs, and accepting HIV tests were factors associated with consistent condom use.

Conclusions: The findings suggest that consistent condom use and awareness of HIV/AIDS prevention-related knowledge among FSWs have been improved by the intervention. Further prioritized and combined prevention programs aimed at FSWs are needed in order to prevent the HIV/AIDS epidemic spreading in the general population in China.

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1. Introduction

Up until 2011, and since the first case of a person infected by HIV was identified in China in 1985, it is estimated that the number of people living with HIV/AIDS (PLHIV) in China is 780 000, including 154 000 AIDS patients.[1] Between 2005 and 2007, the number of new HIV infections estimated to have been contracted by heterosexual contact increased from 10.7% to 37.9% of total HIV cases, while the proportion of HIV transmissions caused by drug use fell from 44.3% to 29.4%.[2,3] A significant proportion of HIV transmissions in 2007 was estimated to have occurred between female sex workers (FSWs) and their clients.[2] The HIV epidemic in China is further complicated by growing evidence of mixing between intravenous drug users and people who have contracted HIV through sexual contact.[4–8] FSWs, as a population at high risk of contracting and transmitting HIV/AIDS, play an important role in the prevention of the spread of AIDS and sexually transmitted diseases (STDs).[9–11]

The transmission of HIV/AIDS and rates of infection of the virus are closely related to human behaviors, and it has been widely proven that persistent health education and the promotion of intervention activities are the most effective counters to HIV transmission around the world.[12–15] Condom use is recommended by governments and researchers as a useful tool to prevent FSWs and their clients from contracting HIV/AIDS and other STDs.[16–19] When Hong and Li reviewed HIV/AIDS behavioral interventions in China,[20] they found that most interventions had been concentrated in the south and southwest of the country, with a lack of study data available from other regions.

The city of Hohhot is the provincial capital of the Inner Mongolia Autonomous Region in northern China. It has a

* Corresponding author. Tel.: +86 10 82802502; fax: +86 10 82802502.
E-mail address: wpeiyu@bjmu.edu.cn (P. Wang).

[1] Y. Shi and S. Guo are joint first authors and contributed equally to this work.

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Table 1
Socio-demographic characteristics of female sex workers surveyed in 2006–2008 in Hohhot, Inner Mongolia[a]

Variables	2006 ($n=624$), n (%)	2007 ($n=444$), n (%)	2008 ($n=451$), n (%)
Mean age, years	26.9 ± 7.0	25.1 ± 4.9	25.9 ± 5.7
Ethnicity			
Han	521 (83.5)	389 (87.6)	369 (81.8)
Mongolian	56 (9.0)	37 (8.3)	58 (12.9)
Other	47 (7.5)	18 (4.1)	24 (5.3)
Education, years[b]			
Illiterate	9 (1.4)	9 (2.0)	4 (0.9)
≤6	93 (14.9)	40 (9.0)	32 (7.1)
7–9	327 (52.4)	269 (60.6)	239 (53.0)
10–12	170 (27.2)	114 (25.7)	156 (34.6)
>12	25 (4.0)	12 (2.7)	20 (4.4)
Marital status[b]			
Single	249 (39.9)	278 (62.6)	279 (61.9)
Married	202 (32.4)	133 (30.0)	135 (29.9)
Cohabitating	105 (16.8)	16 (3.6)	22 (4.9)
Divorced	68 (10.9)	17 (3.8)	15 (3.3)
Work venue[b]			
Karaoke bar[c]	281 (45.0)	239 (53.8)	189 (41.9)
Sauna	178 (28.5)	85 (19.1)	117 (25.9)
Hair salon[c]	44 (7.1)	37 (8.3)	80 (17.7)
Street	121 (19.4)	83 (18.7)	65 (14.4)
Residency[b]			
Inner Mongolia	303 (48.6)	90 (20.3)	256 (56.8)
Other province	321 (51.4)	354 (79.7)	195 (43.2)

[a] The t-test was used for the comparison of mean age, and the Chi-square test was used for percentage comparisons across the different years.
[b] $p<0.05$.
[c] Karaoke bars also included night clubs, bars, and hotels; hair salons included hair and beauty salons.

population of approximately 2.8 million inhabitants, including many ethnic minorities. Although Hohhot is still considered a low-epidemic area in China (only 14 HIV antibody-positive found among five high-risk populations in the AIDS sentinel surveillance 2009) compared to other big cities (1636 HIV antibody-positive in Kunming and 1190 HIV antibody-positive in Beijing),[8,21] there has been a pronounced upward trend in HIV/AIDS transmission. The number of reported HIV/AIDS cases since 2006 accounts for 88.9% of all cases in the city (unpublished data from the Hohhot Center for Disease Control and Prevention (CDC)). Sexual intercourse has become the main route of HIV/AIDS transmission.

In 2006, an HIV preventive intervention program was initiated in China with the support of The Global Fund to Fight AIDS, Tuberculosis and Malaria; FSWs were targeted in the first instance, as they are considered a high-risk population. To assess and document the impact of this program, we conducted three unlinked, anonymous, cross-sectional, integrated behavioral and laboratory assessments on samples of FSWs. The first assessment was conducted as a baseline survey in 2006, the second approximately a year after the initiation of the project, and the third another year later.

2. Methods

2.1. Study design

The Chinese CDC in conjunction with provincial and local CDC staff of the Inner Mongolia Autonomous Region conducted three serial cross-sectional investigations of FSW sexual behaviors during 2006–2008 in Hohhot. The surveys were conducted in July, September, and October of each of the study years. The FSWs were enrolled by stratified cluster method. A 50% rate of consistent condom use with commercial clients was used to estimate the sample size, with 90% power and an alpha error rate of 5%. After estimating the whole sample size, estimated numbers of FSWs at each work venue were calculated based on their percentages in 2006. Work venues were classified into four separate groups: (1) karaoke bars, night clubs, bars, and hotels, (2) saunas, (3) hair and beauty salons, and (4) street-based. The numbers of eligible participants in the three surveys were 624 in 2006, 444 in 2007, and 451 in 2008. The numbers of FSWs at each work venue are shown in Table 1. For the purposes of this study a FSW was defined as a female aged over 14 years who conducted commercial sex work as a business. The definition excluded those supplying a masturbation-only service, such as massage services in professional massage parlors. Nor did it include those who occasionally accepted commercial sex in their place of work, such as waitresses and bartenders.

After providing informed consent, participants were asked standardized questions about their demographics, HIV/AIDS-related knowledge, and behaviors by trained CDC staff.

2.2. Interventions

The targeted population was all FSWs in Hohhot. The program was focused on three key intervention activities at their work venues: (1) community mobilization and peer-mediated outreach, including condom promotion and provision (the 100% condom use program); (2) increased access to and utilization of sexual health services, expansion of condom accessibility through social marketing, and increased condom availability in non-traditional outlets; and (3) voluntary HIV counseling and testing (VCT). AIDS/HIV-related information, education, and communication (IEC) materials including booklets, pamphlets, and folded leaflets were distributed among FSWs during the program period. The intervention activities were carried out by the Hohhot CDC after the baseline survey and FSWs could participate in these activities at their work venues or at the CDC voluntarily.

2.3. Measurements

The survey collected the following information: (1) socio-demographic characteristics, (2) HIV/AIDS-related knowledge, (3) sexual behaviors, and (4) results of laboratory tests.

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