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Need for Intervention Services for Promotion of Condom Use by Female Sex Workers to Consider Size of Entertainment Venues: A Cross-Sectional Study

Authors' Contribution:
Study Design A
Data Collection B
Statistical Analysis C
Data Interpretation D
Manuscript Preparation E
Literature Search F
Funds Collection G

ABCDEF 1 **Baifeng Chen**
CDEF 1 **Jian Chen**
BCD 1 **Yinbao Shao**
BCD 1 **Daibao Hu**
ABD 2 **Xinping Ding**
ABCDG 1 **Yufeng Wen**

1 School of Public Health, Wannan Medical College, Wuhu, Anhui, P.R. China
2 Fuyang Center for Diseases Prevention and Control, Fuyang, Anhui, P.R. China

Corresponding Author: Yufeng Wen, e-mail: wyf@wnmc.edu.cn

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Background: Consistent condom use among female sex workers (FSWs) is a key intervention in China's AIDS Control Program. Female sex workers (FSWs) in China are at increased risk for acquiring HIV/AIDS because of low knowledge about HIV transmission and inconsistent use of condoms, the grade of venues may play a role in HIV/AIDS-related knowledge and consistent condom use of female sex workers.

Material/Methods: A cross-sectional study was conducted among 802 FSWs in 2016 in Fuyang, China. A self-administered questionnaire was used to assess whether there is a need of different intervention services promotion of consistent condom use among FSWs in different-grade entertainment venues.

Results: Multivariate logistic regression analysis indicated that knowledge scores of HIV transmission routes and peer education were associated with consistent condom use in large-size venues, while peer education was associated with consistent condom use in mid-size venues. Knowledge scores of HIV non-transmission routes, knowledge scores of AIDS prevention/control, and peer education were associated with consistent condom use in small venues.

Conclusions: Our data suggested that the strategies for strengthen interventions on health benefits of consistent condom use of FSWs should differ by size of venue.

MeSH Keywords: **Condoms, Female • Cross-Sectional Studies • HIV • Sex Workers**

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Background

The HIV epidemic has undergone dramatic changes in China, from predominantly blood-borne transmission in the early 1980s through the 1990s, to a predominantly sexually-mediated transmission in the 21st century. Female sex workers (FSWs) should be considered a priority group for prevention of HIV [1,2]. Recent studies have shown that sexual transmission accounted for more than 80% of new HIV infections in 2012 and this trend of increase was expected to continue [3]. FSWs were one of the key populations who were monitored by the National Sentinel Surveillance System due to high risk of HIV infection and transmission through commercial sex [4,5]. They are considered an important bridge population in the transmission of AIDS and STI (sexually transmitted infection) between the high risk clients and low risk (or non-commercial) partners such as husbands or steady boyfriends [6,7]. Previous studies indicated that HIV/AIDS awareness was varied among FSWs who came from different venue size [8]. Evidence shows that promoting consistent condom use during commercial sexual intercourse among FSWs remains the most effective way to prevent the transmission of HIV [9,10]. Condoms have been promoted among FSWs for more than a decade in China, and the rate of condom use among FSWs has been increasing in China. However, a considerably high proportion of the FSWs do not use condoms regularly. Indeed, a study revealed that consistent condom use with clients in one month was approximately 60% to 74% from 2004 to 2008 among FSWs across 15 surveillance sites [11]. The current study attempted to explore AIDS intervention services promotion of condom use among FSWs from different size venues.

Material and Methods

Study site

The research site was City A, a city in Anhui province. Anhui is an inland province in Southeast China with a population over 64.6 million. City A, with a population over 7.82 million in 2015 is the most populous city in Anhui province. In the early 1990's, illegal blood donation was found in abundance in this area, result in increase in HIV infection rates of this area, City A is a key area of AIDS prevention and control. There are an estimated at least 200 commercial sex venues in the urban areas of City A with about 3000 FSWs providing commercial sex service. Furthermore, locations along the street, city squares, or public parks where women solicit clients were identified. An additional 1,000 FSW work in these non-venue settings, totaling an estimated 4,000 FSW in the metropolitan area of City A.

Participants and survey procedure

The participants were recruited from different size entertainment venues in A city in 2016. The research team identified entertainment venues in A City through ethnographic targeted sampling strategies [12]. The owners/managers of these venues were contacted for their permission to conduct research in their premises. Trained outreach health workers from the local Center for Disease Control (CDC) approached FSWs to ask for their participation. Among 1141 FSWs contacted, 802 (70.3%) agreed to participate in this study. Face-to-face interviews were conducted by well-trained staff members of the CDC in City A. Interviews were conducted in separate rooms or private spaces in the venues where participants were recruited, No one was allowed to stay with the participant during the survey except the interviewer who provided the participant with necessary assistance. The questionnaire took about half an hour to complete. This study was approved by the Ethics committee of Wannan Medical College, Anhui province of China. Written informed consent was obtained from all participants.

Measures

Study participants were given a self-administered questionnaire which was adapted from the National HIV Sentinel Surveillance embodiment. The questionnaire contains 4 main components: included participants' demographic characteristics, HIV-related knowledge, Assessment of consistent condom use, Influence of peer education.

Demographic information

The demographics included age, marital status, registered residence, education level and work place. The participant's work place was divided as 3 grade, large-size venues (Bath centers and night clubs were classified), mid-size venues (KTV/bars and hotels were classified), small-size venues (while hair salons, small restaurants, and others).

HIV/AIDS-related knowledge

Eight HIV-related questions were used to assess HIV knowledge level, including 3 questions about HIV transmission modes, 3 questions about HIV misconceptions and 2 questions about HIV prevention. Correct answer was scored 1, wrong answer or "do not know" was scored 0. The range of scores was 0 point (complete lack of awareness) to 8 points (full awareness). Two groups were stratified according to whether they got 6 or higher HIV-related knowledge score. HIV/AIDS knowledge awareness was defined as a total score greater than, or equal to 6 points, otherwise defined as awareness. The possible range of knowledge scores about HIV transmission routes, HIV non-transmission routes and AIDS prevention/control were 0-3,

0-3 and 0-2, respectively. The scores were averaged to calculate the average scores.

Assessment of consistent condom use

Participants were asked about the frequency of condom use during commercial sexual intercourse in the previous month. A participant who answered that she always used condoms during the previous month was considered as a consistent condom user. Otherwise she was classified as an inconsistent condom user.

Influence of peer education

Participants were asked if they had accepted the peer education program which was carried out by local CDC in the last year, and they were expected to answer “yes” or “no”.

Data analysis

Chi-square statistics were employed to test the demographic characteristic among FSWs in the 3 grade venues. Analysis of variance was performed to compare the knowledge scores of HIV non-transmission routes, HIV transmission routes, AIDS prevention/control among FSWs in the 3 grade venues. Chi-square statistics were employed to test the correlation of received AIDS prevention service with HIV/AIDS awareness and consistent condom use among FSWs in the 3 different grade venues. Ultimately, multivariate logistic regression analysis was used to evaluate the factors associated with consistent condom use among FSWs from 3 grade venues. All analyses were performed by SPSS 20.0 (SPSS Inc., Chicago, IL, USA). $P < 0.05$ were considered statistically significant.

Results

Demographic characteristics

As shown in Table 1, there were 411 participants recruited from large-size venues, 171 recruited from mid-size venues, 220 recruited from small-size venues. The average age of the respondents was 28.15 (SD=7.22) and most of them (59.4%) reported married, and most of them (62.0%) having received a junior school education, and most of them (78.2%) were coming from Anhui province, and most of them (44.0%) were working in A city for a period of 3-6 month. The percentage of participants who were aged 30 years and above, married, and below junior school educational background in small-size venues was significantly higher than those in large-size venues and mid-size venues ($P < 0.001$).

HIV/AIDS-related knowledge scores of different size venues

As shown in Table 2, the knowledge score of HIV non-transmission routes was significantly lower than that of HIV transmission and AIDS prevention/control among FSWs from different size venues ($F=45.15$, $P < 0.001$; $F=31.75$, $P < 0.001$; $F=43.70$, $P < 0.001$).

The associations of HIV/AIDS awareness, consistent condom use with HIV preventive service

As shown in Table 3, the rate of HIV/AIDS knowledge awareness among FSWs in high, middle and small-size venues were 93.43%, 92.40% and 81.82%, respectively. Acceptance of AIDS prevention services was significantly correlated with HIV/AIDS awareness in the mid-size (OR=4.19, 95%CI=1.11~15.81) and small-size venues (OR=7.14, 95%CI=2.12~24.07), but there was no correlation in large-size venues (OR=1.02, 95%CI=0.34~3.06).

As shown in Table 4, the rate of condom use with clients in the previous month among FSWs from high, middle and small-size venues were 84.67%, 77.78% and 62.73%, respectively. Correlation between received AIDS prevention service and consistent condoms use was statistically significant in large-size (OR=2.91, 95%CI=1.55~5.50), mid-size (OR=12.08, 95%CI=4.42~33.01) and small-size venues (OR=4.11, 95%CI=2.04~8.27).

Multivariate analysis

Multivariate logistic regression analysis indicated that different factors were associated with consistent condom use in 3 size venues (Table 5). The intervention services associated with consistent condom use in large-size venues were knowledge scores of HIV transmission routes (OR=5.75, 95%CI: 1.30~25.38) and peer education (OR=4.44, 95%CI: 2.17~9.06); but in mid-size venues it was peer education (OR=6.75, 95%CI: 1.30~35.02). In small-size venues, the factors were knowledge scores of HIV non-transmission routes (OR=3.24, 95%CI: 1.17~8.97), knowledge scores of AIDS prevention/control (OR=9.68, 95%CI: 1.76~53.24), peer education (OR=6.69, 95%CI: 1.52~29.48).

Discussion

As one of the first attempts to explore venue-based intervention strategies to promote consistent condom use among FSWs, the current study helps to expand our knowledge in understanding the difference of intervention strategies in different-size entertainment venues. Our research shows that the characteristics of FSWs were varied in 3 size venues. Our findings support the result of previous studies which reported that FSWs in small-size venues such as hair salons and massage

Table 1. Demographic characteristics of FSWs in different size venues [n(%)].

Characteristics	Large-size venues (n=411)	Mid-size venues (n=171)	Small-size venues (n=220)	p Value
Age (years)				
<20	41 (9.98)	36 (21.05)	19 (8.64)	<0.001
20~	250 (60.83)	90 (52.63)	91 (41.36)	
30~	110 (26.76)	37 (21.64)	64 (29.09)	
40~	10 (2.43)	8 (4.68)	46 (20.91)	
Marital status				
Unmarried	136 (33.09)	97 (56.73)	55 (25.00)	<0.001
Married	244 (59.37)	70 (40.94)	162 (73.64)	
Cohabitant	18 (4.38)	1 (0.58)	2 (0.91)	
Divorced/widowed	13 (3.16)	3 (1.75)	1 (0.45)	
Education level				
Illiterate	6 (1.46)	0 (0.00)	21 (9.55)	<0.001
Elementary	57 (13.87)	17 (9.94)	44 (20.00)	
Junior school	259 (63.02)	109 (63.74)	129 (58.64)	
High school or secondary	84 (20.44)	37 (21.64)	24 (10.91)	
College or above	5 (1.22)	8 (4.68)	2 (0.91)	
Registered residence				
Anhui province	302 (73.48)	151 (88.30)	174 (79.45)	<0.001
Other provinces	109 (26.52)	20 (11.70)	45 (20.55)	
Duration working in A city (month)				
>12	89 (21.65)	39 (22.81)	52 (23.64)	0.444
6~	82 (19.95)	35 (20.47)	29 (13.18)	
3~	180 (43.80)	73 (42.69)	100 (45.45)	
1~	60 (14.60)	24 (14.04)	39 (17.73)	

Table 2. The comparison of average scores of HIV/AIDS-related knowledge of different size venues.

	Large-size venues	Mid-size venues	Small-size venues
HIV non-transmission routes	0.85±0.25*	0.86±0.26*	0.68±0.36*
HIV transmission routes	0.97±0.14*	0.99±0.06*	0.92±0.18*
AIDS prevention/control	0.95±0.20*	0.98±0.14*	0.89±0.31*
F	45.15	31.75	43.70
p Value	<0.001	<0.001	<0.001

* Conclusions from the post hoc Analysis means that do not share a letter are significantly different, p<0.05.

Table 3. The correlation of HIV prevention service and HIV/AIDS knowledge awareness among FSWs in different size venues.

	Awareness HIV/AIDS knowledge	Unawareness HIV/AIDS knowledge	OR (95% CI)	p Value
FSWs in large-size venues				
Received AIDS prevention service	328 (79.81)	23 (5.60)	1.02 (0.34–3.06)	0.97
Not received AIDS prevention service	56 (13.63)	4 (0.97)		
FSWs in Mid-size venues				
Received AIDS prevention service	88 (51.46)	3 (1.75)	4.19 (1.11–15.81)	0.023
Not received AIDS prevention service	70 (40.94)	10 (5.85)		
FSWs in small-size venues				
Received AIDS prevention service	66 (30.91)	3 (0.45)	7.14 (2.12–24.07)	<0.001
Not received AIDS prevention service	114 (51.82)	37 (16.82)		

Table 4. The correlation of HIV prevention service and condom use among FSWs in different size venues.

	Consistent condom use in last month	Inconsistent condom use in last month	OR (95% CI)	p Value
FSWs in large-size venues				
Received AIDS prevention service	306 (74.45)	45 (10.95)	2.91 (1.55–5.50)	0.001
Not received AIDS prevention service	42 (10.22)	18 (4.38)		
FSWs in mid-size venues				
Received AIDS prevention service	86 (50.29)	5 (2.92)	12.08 (4.42–33.01)	<0.001
Not received AIDS prevention service	47 (27.49)	33 (19.30)		
FSWs in small-size venues				
Received AIDS prevention service	57 (25.91)	12 (5.45)	4.11 (2.04–8.27)	<0.001
Not received AIDS prevention service	81 (36.82)	70 (31.82)		

parlors, may be exposed to higher risk of HIV infection [13,14]. The possible reason for this is that FSWs in small-size venues are less educated, older in age, more in married category, and have lower rate of condom use in commercial sex. In contrast, FSWs in large and middle size venues, such as bath centers, night clubs, KTV/bars and hotels are younger, better educated and have more access to medical care. Thus, they have higher rates of condom use in commercial sex.

Levels of HIV/AIDS-related knowledge were 93.43%, 92.40% and 81.82% among FSWs of large-size, mid-size and small-size venues, respectively. Although awareness of HIV/AIDS knowledge in this group was high, the rate of condom use during commercial sex was still low. The most common reason given was the urge to earn much more money; FSWs often accepted clients who do not use condoms during sexual intercourse [15,16]. The lust for higher income may be a key factor

determining condom use with clients [17–19]. Moreover, nearly half of the clients aged 50 years old and above were likely to experience difficulty using condoms due to erectile dysfunction [20]. Previous studies have found that clients of small-size venues had insufficient knowledge and risk perception of HIV/STI infection [21,22].

Regardless of venue size, the average knowledge scores of HIV non-transmission routes were significantly lower than that of HIV transmission routes and AIDS prevention/control. This revealed that there were misunderstandings regarding knowledge of HIV non-transmission routes among FSWs. We obtained similar results in an earlier study [23]. It is clear from this study that the effectiveness and feasibility of the current HIV/AIDS-related education programs are still limited. These misunderstandings can easily contribute to stigmatization and avoidance of contacts with people living with HIV [24,25].

Table 5. The factors associated with consistent condom use by multivariable logistic regression among FSWs of different size venues.

Predictors	aOR (95% CI)	p Value
Large-size venues		
Knowledge of HIV transmission routes	5.75 (1.30–25.38)	0.024
Knowledge of HIV non-transmission routes	2.16 (0.97–4.78)	0.057
Knowledge of AIDS prevention/control	4.62 (0.89–24.01)	0.069
Received peer education in last year	4.44 (2.17–9.06)	<0.013
Mid-size venues		
Knowledge of HIV transmission routes	4.52 (0.71–28.69)	0.109
Knowledge of HIV non-transmission routes	1.90 (0.90–4.01)	0.091
Knowledge of AIDS prevention/control	6.35 (0.77–52.14)	0.085
Received peer education in last year	6.75 (1.30–35.02)	<0.000
Small-size venues		
Knowledge of HIV transmission routes	3.45 (0.73–16.35)	0.119
Knowledge of HIV non-transmission routes	3.24 (1.17–8.97)	0.022
Knowledge of AIDS prevention/control	9.68 (1.76–53.24)	<0.000
Received peer education in last year	6.69 (1.52–29.48)	0.017

aOR – adjusted odds ratio; CI – confidence interval.

AIDS prevention services such as distribution of condoms and HIV counseling have been documented as effective measures for enhancing HIV/AIDS awareness. The acceptance of AIDS prevention services is much more important for FSWs in small-size and mid-size venues, but there was no correlation between AIDS prevention services and HIV/AIDS awareness in large-size venues. FSWs in large-size venues already have basic HIV/AIDS knowledge because of their higher educational levels. Moreover, these younger, well-educated FSWs spent much of their spare time in the internet to get information on HIV/AIDS. Thus, they are less concerned about government's AIDS prevention services. It is encouraging that AIDS prevention services can promote consistent condom use among FSWs in all 3 size venues, and it may contribute to improvement of both knowledge and skills to negotiate condom use with clients, which is still a simple and efficient means of preventing HIV/AIDS at present. FSW should consider negotiation of condom use such as helping the clients to maintain an erection, or persuading the clients through arousal of dread for disease [26–28]. Moreover, environmental supports like requiring managers of venues to make condoms available on-site and free to FSWs may also decrease risky behavior [18–29]. Our results suggest the need for Chinese government to continue to strengthen AIDS prevention services, especially in small-size venues.

The results of multivariate logistic regression model show that knowledge of HIV non-transmission was a factor that promoted consistent condom use in small-size venues. For example,

some FSWs think that they can judge whether a person has AIDS or not by appearance [30]. Indeed, some FSWs base their use of condom on mere client's physical appearance thereby increasing the probability of HIV infection [8].

In summary, knowledge on non-transmission of HIV non-transmission should be strengthened. Peer education is a predictor of consistent condom use among FSWs in all 3 size venues, this underscores the importance of promoting peer support for condom use as a potentially effective prevention strategy.

Several potential limitations should be considered in the interpretation of the findings. First, this study is cross-sectional study, which limits our ability to make a causal inference regarding the relationship between independent variables and consistent condom use. Second, information biases particularly those related to condom use may exist in our study, despite the extensive training on survey administration and working with sex workers that study staff received. The rate of condom use may be inflated due to desire for conformity or stigma.

Despite these limitations, these findings have some important implications for future venue-based research and interventions among FSWs in China. Public awareness and health education activities should focus on knowledge of ways to stop HIV transmission. Although many of the FSWs recruited in this study have high awareness of fundamental HIV knowledge and use condoms to prevent HIV infection, many did not

practice safer sex consistently, especially in small venues. Thus, more effective intervention is needed. Given that the FSWs in this study have different predictors of consistent condom use, working more closely with FSW in the different kinds of venues could help distinguish the best ways to promote consistent condom use. The current strategies of HIV/AIDS intervention services should be adjusted according to FSWs' demographic characteristics.

Conclusions

Our results show that publicity and health education activities should focus on HIV non-transmission knowledge. Although many of the FSWs recruited in this study have high awareness of fundamental HIV knowledge and they could use condoms to prevent HIV infection, many did not practice safer

sex consistently, and, especially in low-grade venues, more effective interventions are needed. Given that the FSWs in this study have different predictors of consistent condom use, working more closely with FSWs in different kinds of venues could help determine the best ways to promote consistent condom use, and the current strategies of HIV/AIDS intervention services should be adjusted according to FSWs' demographic characteristics.

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Conflict of interest

None.

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