

## Study on Risk Factors of Older Female Sex Workers Infected with AIDS and Sexually Transmitted Diseases

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**Abstract: Objectives** This article aimed to figure out the epidemic situation and risk factors of AIDS and syphilis among old female sex workers (OFSWs) in Qingdao, and to provide foundation for aimed interventions. **Methods** In 2013, 406 cases of study participants were recruited in the qualitative research and community-based companion promotion survey, one-to-one questionnaire survey was conducted and blood samples were taken to detect HIV and syphilis. **Results** There were 0 case of HIV-positive in older female sex workers and 120 cases of syphilis-positive in older female sex workers (29.6%); ANOVA showed that Qingdao local household register, age and whether HIV testing was done were risk factors for syphilis infection. **Conclusion** The syphilis infection rates of OFSWs in Qingdao were high, and the risks of infection and spread of AIDS were also increasing daily.

**Keywords:** Older female sex workers; HIV/Syphilis; Infection; Risk factors

Female sex workers were the core populations for AIDS and sexually transmitted diseases(STDs). Their risk of being infected AIDS and STDs was much higher than the general population and they played an important role in transmitting AIDS and STDs<sup>[1]</sup>. It had been proved that there is much relationship between sex workers' risk sexual behaviors and epidemic of AIDS and STDs<sup>[2]</sup>.The infection rate of syphilis in the elderly population increased significantly. Syphilis infection of the elderly in China accounted for a quarter of the total syphilis cases in 2008<sup>[3-4]</sup>.In recent years, the research on prevention and control of sex workers had been paid much attention, but prevention and control work on older female sex workers had not been

carried out. Qingdao was a low AIDS epidemic area, but according to the monitoring and testing of HIV and syphilis infection status, the infected among old female sex workers (OFSWs) who were older than 35 in Qingdao have been found. This study was community-based for the first time, qualitative and quantitative research methods were adopted to evaluate highly risk factors of AIDS and STDs among OFSWs in Qingdao. This study provided evidence for prevention measures for OFSWs.

### 1. Materials and Methods

#### 1.1 Object of study

Study participants were recruited in the qualitative research and community-based respondent

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Published at: <http://www.ijsciences.com/pub/issue/2016-04/>  
DOI: 10.18483/ijSci.990; Online ISSN: 2305-3925; Print ISSN: 2410-4477



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driven sampling (RDS) survey in 2013, and the recruitment standard is as follows. Firstly, women live in Qingdao. Secondly, age is not less than 35 years of old (according to the results of qualitative research carried out in 2012). In addition, providing commercial sexual behavior at least once a week before they participated in the study<sup>[5]</sup>. Lastly, willing to and having ability to complete the questionnaire. All subjects signed informed consent. 406 cases were included in the study.

## 1.2 Investigation method

Method of comprehensive (including qualitative and quantitative methods) is adopted to achieve the research goals.

### 1.2.1 Qualitative research

Selecting 10 leaders of OFSWs and 5 bosses of commercial sexual service hotel for group interview, the interview only involves the risk of being infected AIDS and STDs, but not involves the leaders' and the bosses' personal problems. After the interview, each header and boss is required to recommend three OFSWs for interviews. Interviews were arranged in a separate room and conducted by trained female interviewers.

### 1.2.2 Community-based respondent driven sampling (RDS) survey

According to RDS requirements, 5 OFSWs located in different places in Qingdao is selected. Researchers explain the purpose of the study, process and recruitment selection criteria to investigate seed. They recruited three companions from their respective network by recruitment vouchers as the first Research Object. The samples are investigated by trained investigators via questionnaires. 406 samples were investigated in total.

### 1.2.3 Questionnaire survey

The questionnaire content mainly includes as follows: the demographic data; OFSWs' sexual work history; risk behaviors of infected with HIV/AIDS and STD; personnel factors based on social network; environmental factors. After the questionnaire survey, researchers measured the questionnaire entries by apparent validity and content validity and adjust it

according to the results of the assessment. Preliminary experimental study was carried on, modifying and perfecting questionnaire by qualitative technology (cognitive interview) and quantitative technology (psychological assessment).

### 1.2.4 Laboratory examination

Getting 5ml blood collection to AIDS screening center laboratory for HIV antibody screening and treponema pallidum antibodies. If there is HIV antibody positive samples, it will be sent to the laboratory for confirmatory tests.

### 1.3 Quality control

Researchers take charge of quality inspector. They monitor and check the research process at any time. Investigators are uniform training. The object of study must be in accordance with the standard and avoid repeated study object. Biological sample collection and detection must abide by 《technical specification for the national AIDS testing》. Using computer aided interviews to ensure the accuracy of the data.

### 1.4 Data analysis

Epidata3.1 software is adopted to establish the database. Data were double entered and collated. SPSS19.0 software is adopted for statistical analysis.  $X^2$  test was used to contrast the different of ratio between different groups, the result had statistically significant when  $P < 0.05$ .

## 2. Result

### 2.1 General condition

The total of 406 subjects are aged over 35 years in survey, Han Chinese accounted for 98.3%; the majority from other provinces, accounting for 73.4%; marriage has been divorced or widowed account for 62.6%, followed by 34% for those married; As for educational level, the majority of them are primary and secondary schools, accounting for 87%; drug users account for 17.7%.

### 2.2 study on risk factors of OFSWs infected with AIDS and STD.

In the total 406 objects, There are 120 cases of syphilis positive and there is no case of HIV positive.  $X^2$  test for syphilis infection shows that: Age, household

registration and HIV testing are statistically significant ( $P < 0.05$ ). There is no statistical significance in other respects ( $P > 0.05$ ). Chart 1 shows that in detail.

Chart 1. risk factor analysis of syphilis infection

variate	No Syphilis %, (no.)	Syphilis %, (no.)	$\chi^2$	$P$
age	35-44	75.1 (163)	24.9 (54)	9.849 0.007
	45-54	68.4 (108)	31.6 (50)	
	55-65	48.4 (15)	51.6 (16)	
census register	Qingdao	57.4 (62)	42.6 (46)	12.009 0.001
	Not Qingdao	75.2 (224)	24.8 (74)	
marital status	unmarried	78.6 (11)	21.4 (3)	0.462 0.794
	married	70.3 (97)	29.7 (41)	
	divorced/widowed	70.1(178)	29.9 (76)	
educational status	illiteracy	65.0 (65)	35.0 (7)	4.193 0.38
	primary school	71.8 (122)	28.2 (48)	
	Junior high school	72.1 (132)	27.9 (51)	

	High school/secondary	56.3 (18)	43.8 (14)		
	College degree or above	100.0 (1)	0		
Han Chinese	yes	70.7 (282)	29.3 (117)	0.605	0.437
	no	57.1 (4)	42.9 (3)		
drugs	yes	62.5 (45)	37.5 (27)	2.652	0.103
	no	72.2 (241)	27.8 (93)		
Using condom	yes	71.7 (213)	28.3 (84)	0.862	0.353
	no	67.0 (73)	33.0 (36)		
HIV/syphilis detection	yes	66.6 (201)	33.4 (101)	8.556	0.003
	no	81.7 (85)	18.3 (19)		
The age of the first sex trade	<35	74.1 (137)	25.9 (48)	2.128	0.145
	≥35	67.4 (149)	32.6 (72)		

### 3. Conclusion

With the development of economy and the increase of floating population, HIV/AIDS and syphilis also increased significantly. As a bridge of HIV/AIDS and STDS, OFSWs are the core populations for AIDS

STDs. This research shows that syphilis infection rate of OFSWs in Qingdao is lower than which is in Sichuan Province(62.5%)<sup>[6]</sup>. But it is higher than prevalence rate of young female sexual workers(7.36) in Qingdao and also higher than the national average

level of infection [7-8]. The majority of OFSWs are divorced or widowed, most of their service object are elderly and low-income people who are at the bottom of society, so they are receptive to unsafe sex<sup>[9-11]</sup>. And Condom utilization rate is low in Condom utilization rate is low, which increases the risk of the disease. Additionally, the risk of infection for local OFSWs of Qingdao is higher than the non-locals. The local residents have a higher risk of infection than floating populations in Qingdao, this is maybe because locals are open, wide-social<sup>[13-14]</sup>. Carrying out HIV/syphilis testing services for OFSWs can detect the more positive people, the ratio of OFSWs who request to have a HIV/syphilis testing was 74.4%, and the probability of diagnosis for syphilis patients is 33.4% which is higher than others. So it is very important to improve the initiative of OFSWs for testing in the future intervention work of HIV/syphilis testing. The number of OFSWs with initiative for HIV/syphilis detection accounted for 74.4% and the infection rate of syphilis detected was 33.4%, which were higher than these of other groups, suggesting that how to increase the initiative of OFSWs for detection is the focus of intervention work of HIV/syphilis in the future.

There is no HIV-infected found in this research, it is in accordance with previous research results of Qingdao is low HIV epidemic area<sup>[15]</sup>. In 2008, anonymous survey shows that female sex workers of entertainment HIV antibodies were all negative<sup>[16]</sup>. But that doesn't mean the OFSWs without infection but means infection rate is still low. Due to the infection with syphilis and other sexually transmitted diseases, genital tract mucosal ulcer will appear and the susceptibility of HIV will increase<sup>[17]</sup>, also OFSWs with syphilis and other venereal diseases will develop colossal ulcer in genital tract which increases the susceptibility of HIV. STDs is an important co-factor infected with the HIV<sup>[18]</sup>. Compare with other STDs, syphilis increased susceptibility to HIV infection. With the transfer of HIV from a specific high-risk groups to the general population, especially the aging trend<sup>[19]</sup>, risk of infection and spread of HIV was also increasing in

OFSWs.

In conclusion, for OFSWs in Qingdao, syphilis infection rate is high and the risk of infection and spread of HIV/AIDS increased. In the future, it should pay more attention to locality census register OFSWs, more testing services for OFSWs to reduce the HIV/AIDS and STDS.

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