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## Family Network, Workplace Network, and Their Influence on Condom Use: A Qualitative Study Among Older Female Sex Workers in China

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### Abstract

The objective of this study was to qualitatively explore the components of social networks and their influence on condom use among older female sex workers (FSWs) aged 35 years and older in China. In-depth interviews with 63 older FSWs and 6 focus groups interviews with pimps and owners of roadside salons and hotels were conducted in three Chinese cities. The mean age of participants was 42.6 years old ( $SD = 6.9$  years) and the mean age of starting sex work was 38.6 years old ( $SD = 6.6$  years). Two types of networks that influenced condom use were identified: family networks (relationship with children and husbands) and workplace networks (relationship with peers, clients, pimps and owners). Relationships between older FSWs and their children negatively influenced condom use. Low levels of network support and norms regarding condom use were observed in the relationship between older FSWs and their clients, whereas positive social support and norms were prevalent among older FSWs who had frequent contact with peers. Norms for condom use existed among pimps and owners, but were counterbalanced by monetary gains. Future HIV interventions for older FSWs should take the different features of social network components into consideration.

### Keywords

AIDS/HIV; sex work; aging & sexuality; condoms; qualitative methods

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The epidemics of human immunodeficiency virus (HIV) and sexually transmitted infections (STIs) in China have spread rapidly among older adults (Liu et al., 2012). According to a recent report, the proportion of people newly infected with HIV who were aged 50 years or

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older increased rapidly from 2% in 2000 to 21% in 2011 (Ministry of Health of the People's Republic of China (MOH), 2012). Similarly, the proportion of STI cases among older individuals increased from 3.8% in 1998 to 9.1% in 2005 (Pearline et al., 2010). Commercial sex is a major mode of transmission among this vulnerable population, as the majority of HIV or STI infected older adults reported a history of commercial sex with older female sex workers (FSWs) who were 35 years old or older (Pearline et al., 2010).

Sex work in China has a long and complex history (Gil, Wang, Anderson, Lin, & Wu, 1996). Before the Communist Party took power in 1949, STIs were common and commercial sex was the predominant mode of transmission. After a series of campaigns against prostitution in the 1950s, sex work was virtually eliminated and STIs were successfully controlled by the early 1960s. However, this situation changed rapidly thirty years later when China opened its door to the world and the commercial sex industry was revived (Liu, Detels, Li, Ma, & Yin, 2002; van den Hoek et al., 2001). According to the 2007 estimates for people at risk for HIV infection, there were 1.8 – 3.8 million FSWs in China (L. Wang et al., 2009). The HIV prevalence among FSWs between 1996 and 2010 in China remained relatively low and stable (0 – 10.3%; median = 0.6%), except for several areas of higher prevalence in Yunnan and Guangxi (Poon, Li, Wang, & Hong, 2011). Prostitution in mainland China is illegal, but persists in both urban and rural areas. Sex work is scorned in Chinese culture, forcing sex workers to face social adversity, including stigma, discrimination, vulnerability to violence and a disparate burden of HIV and STIs (Gil et al., 1996; Pirkle, Soundardjee, & Stella, 2007). Sex work in China can be categorized into three levels (high, medium, and low) according to workplace, income, and client socioeconomic background (Huang, Henderson, Pan, & Cohen, 2004; Pirkle et al., 2007). High-level sex workers typically operate out of luxury hotels and provide commercial sex to well-off businessman and other high-income individuals. Mid-level sex workers usually work in dance halls, karaoke bars, massage parlors, and beauty salons. Their clients include private businessmen and other mid-income individuals. Low-level sex workers are usually older (in their 30s) and solicit commercial sex in roadside beauty salons, on streets, in parks, or at construction sites. Their clients include labor workers, rural-to-urban migrants, older adults, and individuals with low income. Previous studies have shown that low-level sex workers have a higher risk for acquiring or transmitting HIV/STIs than those at the high or middle levels (Li et al., 2012) and that condom use among low-level sex workers and their clients was low. In a study conducted among FSWs in 12 cities in China (Zhou et al., 2014), 51% of FSWs did not consistently use condoms with clients. The two major reported reasons for inconsistent condom use were client refusal and clients paying more money if FSWs did not use condoms.

Young FSWs usually start sex work in their early 20s. After making enough money to start their own private business (e.g., run a barbershop, small restaurant, food stand, or sell clothes), young FSWs often quit sex work typically in their 30s (Hao et al., 2014). In contrast, older FSWs usually enter into sex work in their late 30s after they are laid off, divorced, or migrated from rural areas to urban areas (Hao et al., 2014). Previous research in China and other developing countries has extensively examined sexual risks for HIV/STIs and their psychosocial determinants among young FSWs (Ruan et al., 2006; H. Wang et al., 2009). However, findings from these studies may not apply to older FSWs as they may have

different levels of risk for HIV/STIs or possess different psychosocial factors than younger FSWs. Despite the rapid spread of HIV among older adults, little research has focused on older FSWs in China, a critical source of infection.

Engagement in sexual risks (e.g., condomless sex) is not only determined by personal factors, but is influenced by interpersonal and environmental factors. Researchers have recognized that social network factors play important roles in either facilitating or impeding engagement in HIV risky behaviors (Knowlton, Hua, & Latkin, 2005; Latkin, Weeks, Glasman, Galletly, & Albarracin, 2010; Liu et al., 2009). Social networks have been defined as individuals linked to a focal individual by a particular behavior or interaction (Valente, 2010; Wasserman & Galaskiewicz, 1994). An individual egocentric network includes an index person (ego) and his/her network members (alters) (Morris, 2004). Social networks are conceptualized as comprising three components: *relations, structures, and functions* (Hall & Wellman, 1985; House & Kahn, 1985; Knowlton et al., 2005). Network relations refer to the type of network ties (e.g., kin, friends, coworkers, or sex partners). Network structures characterize the relationships among the ego and two or more alters (e.g., network size, closeness, frequency of contacts or interactions with alters) (Miller & Neaigus, 2001). One especially important network component, network functions, includes social support and social norms that can influence network members' adoption or maintenance of behaviors (Cohen, Mermelstein, Kamarck, & Hoberman, 1985; House, 1987; Latkin & Knowlton, 2005). Both social network support and social network norms are highly associated with health and with risky behavior (Johnson et al., 2010; Latkin et al., 2010; Miller & Neaigus, 2001). However, it is unclear how these three components operate in the social networks of older FSW and how their collective roles influence engagement in safe sex.

We conducted a qualitative study of older FSWs in three cities in China. The objectives were to describe the components (i.e., relations, structures, and functions) of different types of networks among older FSWs and their potential influence on unsafe or safer sex practices (condom use). Specifically, our three research questions of interest were: (1) what comprises the social networks of older FSWs? (2) How do social network factors influence safer sex and risky sexual behavior? (3) Who in the social network influences the adoption or dismissal of safer sex practices?

## Method

The study methods have been previously described (Hao et al., 2014). Briefly, the study was carried out in 2012 in three cities in China. Cities were selected by the level of HIV prevalence and included: Qingdao in Shandong Province, east China (low HIV prevalence), Hefei in Anhui Province, central China (mid-level of HIV prevalence), and Nanning in Guangxi Province, southwest China (high HIV prevalence) (MOH, 2012). Our qualitative study consisted of focus groups with pimps, roadside salon and hotel owners (six focus groups with 53 study subjects) and in-depth interviews with 63 older FSWs.

## Recruitment and Participants

The inclusion criteria for older FSW were women who: (1) had lived in Qingdao, Hefei, or Nanning for at least three months; (2) exchanged sex for money at least once a week in the past month, and (3) were at least 35 years old.

Through existing HIV prevention programs targeting FSWs, the local Centers for Disease Control and Prevention (CDCs) developed rapport with FSWs, pimps, venue owners, and bosses. FSWs, pimps, venue owners, and bosses who worked as outreach volunteers with the local CDCs served as key informants for referrals in the study. At each site, key informants were asked to invite 10 pimps (Qingdao and Nanning) or 10 owners of roadside beauty salons (Hefei) from different geographic locations where older FSWs sought clients or had sex. In addition, key informants invited five hotel owners from each site who accommodated commercial sex. A total of six focus groups were conducted with 25 pimps (Qingdao and Nanning), seven salon owners (Hefei), and 21 hotel owners (all three sites). After completing each focus group interview, the moderators asked each pimp and owner to invite two or more eligible older FSWs to participate in in-depth interviews. Sixty-three eligible older FSWs participated in the in-depth interviews (22 in Qingdao, 21 in Hefei, and 20 in Nanning).

## Measures

Key topics explored through the in-depth interviews with older FSWs and focus groups with pimps and venue owners included commercial sex practices, sexual behavior with clients and/or regular sex partners, and the three social network components. Interviewers and focus group moderators were local CDC public health staff or graduate students who were familiar with the local culture and sex work and were experienced in qualitative research. In-depth interview and focus group guides are presented in the Appendix. Before the beginning of the study, interviewers were trained to conduct interviews, obtain rapport with interviewees, and probe for additional information.

## Procedure

All interviews were conducted in private rooms at the local CDCs, restaurant rooms, or hotel rooms. Interviews were digitally recorded and transcribed by trained team members. Potential participants were informed of the purpose, procedures, and potential risks of the study. Full informed consent was obtained from each participant prior to study enrollment. The study protocol was approved by the Institutional Review Boards (IRBs) of Virginia Commonwealth University and three Chinese institutes (Shandong University School of Public Health, Hefei CDC and Guangxi CDC). All four IRBs are registered with the U.S. Office for Human Research Protections.

## Data Analysis

Team members transcribed and entered the digitally recorded interviews into *Atlas.ti 6.2* for data analysis. Three team members analyzed the data thematically in a multi-step process using the constant comparative method. Three transcripts were chosen for open coding, a process of reading small segments of text at a time, examining and comparing events and

actions, and commenting on content or analytic themes related to the primary objective of the study (Sherman et al., 2008; Strauss & Corbin, 1990). Themes that emerged during the open coding process were synthesized into a list to eliminate duplicate codes and group similar items and smaller level codes. Next, a singular draft-coding list was created to code the next three interviews. The list was continuously refined as new themes became apparent, resulting in a final coding theme after all remaining interviews were coded. In total, 1,083 codes were generated for data analysis. Throughout the analytical process, several meetings regarding coding, labeling, emerging themes, and reconciling themes were held by the research team.

## Results

Study participants included 28 street-based sex workers who solicited their clients on the streets and in parks and 35 venue-based FSWs who worked at roadside beauty salons, saunas, massage parlors, dance halls, or karaoke bars. The mean age of the older FSWs was 42.6 years [standard deviation (*SD*) = 6.9] years (range: 35–60 years). Their age at the start of sex work ranged from 28 to 53 years, with a mean age of 38.6 (*SD*=6.6). Most participants (81%) were from rural areas. Only six participants received a high school education, which was the highest education level in this sample. All of the older FSWs had been married at least once. More than half (57%) were divorced or widowed. Among 27 currently married participants, only six lived with their husbands and 11 reported a poor relationship with their husbands. Almost all older FSWs (98%) had one or more children. Most of their children (73%) were at pre-school or school age. About two thirds of the older FSWs previously worked in low-paid service industries e.g., housekeeper, waitress, and shop assistant.

The analysis documented two major types of networks that influenced older FSWs' condom use: family network and workplace network (Table 1). The family network consisted of the FSWs' relations with children and husbands. Three relations were identified in the workplace network: clientele, coworkers/sex worker peers, and pimps, venue owners and bosses. Depending on the network function and structure, these relationships either promoted or deterred consistent condom use.

### Family Network and Condom Use

**Relationship with children**—In the mother-child relationship, older FSWs were responsible for the provision of material support and emotional support to their children. Older FSWs' family responsibility along with financial hardship reduced their power to negotiate condom use in commercial sex. They were willing to sacrifice themselves to fulfill their responsibility to support their children's living expenses and education. *“Nobody likes to do this (sex work) at this (old) age. I got divorced and my daughter needs to go to school, I have to do this (sex work) to earn more money to financially support her. I will do anything for her (child)”* (40 years old, Qingdao, street-based).

Being a mother and raising children and the role of being a sex worker created mental and financial burdens on older FSWs, which contributed to their inability to negotiate condom use. The mental burden stemmed from conflicts related to their dual role as a mother and a

sex worker. Most older FSWs concealed their sex worker identity from their children as a way to cope with cognitive dissonance, and also as a way to secure a sound relationship with their children. As a 37-year-old FSW (Hefei, venue-based) said, *“I have no choice. I cannot tell my daughter about this (sex work). I told her that I ran a food cart. My daughter is a good girl and she is very considerate. For example, she was ill and stayed in a hospital last year. We spent thousands of yuan (500- 1000 USD) in the hospital. Understanding our poor economic situation, she requested to discharge herself from hospital early although she was not fully recovered. I felt guilty for her, and hoped I could make up all the potential loss in her life.”* Because older FSWs desperately need money to financially support their children and comfort them, they placed more weight on making money than protecting themselves by using condoms. A 36-year-old FSW (Hefei, venue-based) described her experience with powerless condom negotiation, *“I requested all my clients to use condoms, but only half of them agreed to use. If I insist on condom use, they would turn me away and look for other FSWs. You know, there are several FSWs here who are willing to have condomless sex. I really do not want to lose a deal with a client.”*

**Relationship with husband**—A few older FSWs lived with their husbands. The majority of sex workers did not tell their husbands about their sex work. Some older FSWs disclosed their sex work to their disabled husbands. As a 45-year-old FSW (Hefei, venue-based) said, *“My husband knows that I am a sex worker. He is disabled, and 10 years older than I. If we were divorced, he would be hurt, and my child would feel hurt too. I had a good relationship with my parents-in-law who take me as their own daughter. Even if I became a beggar in the future, I would not get divorced”*. From a financial perspective, older FSWs were the breadwinners of the family, not their husbands. As one older FSW said, *“My husband did not provide any financial support to our family. I thus could not maintain a good relationship with him. Consequently, I am the only one who provides support to our family (39-year-old, Nanning, street-based).”*

To maintain a normal relationship with their husbands, older FSWs concealed their sex work and did not use condoms with their husband. For those who did not disclose sex work to husbands, non-condom use was considered a sign of loyalty in their relationship. Older FSWs expressed fear that their husbands would identify them as a sex worker if they asked their husband to use condoms. A 38-year-old FSW (Hefei, venue-based) reported, *“I usually do not use condoms with my husband. If I would [ask to] use one, he would ask why. It would cause suspicions.”* Husbands who knew about their wives’ sex work did not want to use condoms either, simply because they trusted their wives and believed that they used condoms with clients. As a 52-year-old FSW (Nanning, street-based) described, *“He (her husband) believes that I do not do it [sell sex to clients] without a condom. He firmly trusts me. Thus, we don’t use condoms.”* Therefore, condomless sex occurred both during commercial and noncommercial sex.

### **Workplace Network and Condom Use**

This study identified two types of networks: a supportive network and a constrictive network. The presence of a supportive or constrictive network either positively or negatively influenced condom use among older FSWs.

## Supportive Networks and Condom Use

**Relationship with FSW peers**—Older FSWs who did not live with family members reported a larger network size, more frequent contacts with FSW peers, and higher levels of positive network support and norms regarding condom use than older FSWs who lived with their family members (see “*socially isolated older FSWs*”).

Older FSWs who did not live with their families worked together with peers at the same venues, such as on a certain street, park, or establishment venue. They conversed when they waited for clients, and engaged in social activities during their free time, such as playing poker, dining, shopping, and singing karaoke. As a 53-year-old FSW (Qingdao, street-based) reported, “*We usually go out together for playing mahjong, dining, or shopping.*”

Positive support or norms towards condom use was established through frequent contacts among older FSWs who did not live with their families. Emotional and tangible support was frequently mentioned, such as:

**Informational support:** (1) Experienced sex workers taught newer FSWs how to use condoms and reminded them of condom use. One older FSW shared her experience; “*My friend (sex worker) encouraged me to use a condom when I had my first client. She told me to use condoms to protect myself from being infected. [Furthermore,] I was too shy to buy condoms at first. My friend (sex worker) bought them for me and taught me how to use them*” (40-year-old, Nanning, venue-based). (2) Information regarding HIV/STI knowledge and related health services was shared among older FSWs through casual interactions. Older FSWs chatted with their friends about HIV/STI knowledge, condom use, and HIV preventive resources (e.g., free HIV testing). “*My FSW friends advised me that using condoms could prevent diseases.*” (40-year-old, Nanning, venue-based). “*When my friends (sex workers) knew when or where there were free services for HIV or STI testing and counseling, they called me and asked me to go there with them*” (36 year old, Nanning, venue-based).

**Tangible support:** (1) Promotion of condom purchasing: pimps, venue owners and bosses reported that venue-based older FSWs usually purchased condoms in bulk together and split the cost. In this way, they could save money and keep condoms available in the workplace. A manager (54 year old, female, Qingdao) noted, “*They buy condoms in a large quantity (wholesale), and then split the cost evenly. It is relatively cheap to buy condoms in a large quantity.*” (2) Provision of condoms to peers: Peers would lend condoms to their coworkers when needed. A 37-year-old FSW recounted help from a friend, “*Sometimes clients had long sex with me, with multiple sex acts. If I ran out of condoms, I could call and ask other coworkers to give me some.*”

**Emotional support:** Supportive condom use was mainly displayed when an older FSW would encounter a conflict with a client who insisted on condom non-use. FSW peers would step in to reconcile the conflict. A 36-year-old older FSW (Nanning, venue-based) said, “*When I get into a conflict with clients, my colleagues will come to mediate the conflict and persuade the client to use a condom.*”

Although some older FSWs received substantial support from their peers, including acceptance of condom use norms, actual condom use remained low simply because the decision to use condoms was governed by clients. As mentioned above, in order to make enough money to support their family, older FSWs usually complied with their clients' requests for condomless sex. When faced with monetary incentives, condom norms became unstable and fragile.

### Constrictive networks and condom use

**Socially isolated older FSWs**—Older FSWs who lived with their children or families were relatively isolated, reported a smaller network size, and infrequent contact with peers. In order to hide sex work from their families, older FSWs who lived with their husbands or children seldom contacted their network peers. Most of them were freelance and solicited clients on streets or in parks. Aside from their sex work, they described their lives as that of normal housewives. One older FSW said, *“I usually stay at home to accompany my child and my mom when they’re watching TV, doing housework or sleeping. (Question: Do you communicate with any friends?) No, I don’t have any friends. How can I communicate with them? My child is around here; it is not appropriate to say something related to my job.”* (40 years old, Qingdao, street-based). These socially isolated older FSWs lacked social support from peers on condom use and health-related information, perhaps making them more likely to engage in condomless sex.

**Relationship with clients**—In most cases, the relationship between older FSWs and their clients was simply a one-time sexual business relation. Because of their strong desire to make more money to support their families, and a large number of sex workers available in the sex work market, older FSWs did not have enough power to negotiate condom use and were frequently obliged to provide “better” sex services (i.e., sex without condoms) to keep clients or compete with other FSWs. However, most of their clients were rural-to-urban migrant workers or old men. These clients in particular did not support condom use and thus, norms regarding male condom use were not well established in these relationships.

As described by venue owners, compared with younger FSWs, older FSWs provided better service to clients due to their strong motivation for making more money to support their children. A pimp from Hefei (Male, 40 years old) compared older FSWs with younger FSWs: *“I observed that older FSWs have a strong motivation for making money. Their conception of making money is different than younger FSWs because they have to support their families and have more concern about their future. They are aware of their older age and physical condition; thus, they perceive that they are not able to do this (sex work) for a long time. Therefore, (compared with younger FSWs), they try their best to provide satisfactory services and exert their utmost efforts to make as much money as they can, including not to use condoms in order to please clients.”*

The strong negative network support towards condom use primarily came from the clients. Almost all older FSWs reported that they were the ones who requested condom use. However, more than half of the clients rejected this request. As mentioned by several older FSW, *“In general, 5 of 10 clients don’t want to use condoms”* (Hefei, 51-year-old, venue-



based); “*At least half of clients don’t want to use condoms; only about one out of ten ask for condom use*” (Qingdao, 50 years old, street-based). Negative norms about condom use with clients clearly impedes safe sex practices in client based networks.

Clients’ low support for and negative norms toward condom use, coupled with older FSWs’ strong intention to earn money, resulted in condomless sex. A 40-year-old FSW (Nanning, street-based) said, “*If clients give me 100 Yuan (20 USD) more, I will have sex with him without a condom.*” Keeping regular clientele was another strategy employed to produce more income; however, steady customers may turn to other FSWs if condom use was insisted on. Additionally, older FSWs did not use condoms when older clients had difficulties achieving or maintaining an erection. Many older FSWs felt condom non-use was the only way to earn money with older clients. They also believed older clients had a lower risk of HIV/STIs. An older FSW stated her opinion towards older clients, “*As aged men don’t frequently go out for sex with sex workers, they are relatively safe (from HIV infection)* (46 years old, Hefei, venue-based).”

**Relationship with pimps, venue owners, and bosses**—Pimps, venue owners, bosses, and older FSWs maintained a reciprocal beneficial business relationship. Pimps, venue owners, and bosses were responsible for recruiting clients for older FSWs, and older FSWs paid a fee to pimps, venue owners and bosses for each sex transaction (Hao et al., 2014). Interactions took place between older FSWs and pimps, venue owners, and bosses depending on the frequency of sex transactions. The structure of the sex work organization of older FSWs has been described in detail elsewhere (Hao et al., 2014).

Pimps,’ venue owners,’ and bosses’ support for condom use varied. In general, they held a supportive attitude towards condom use. A 40-year-old FSW (Nanning, venue-based) noted that her manager even helped sex workers persuade their clients to use condoms. “*Our managers persuaded clients in this way: It [the transaction] is for fun. But for the health of both of you, you’d better use a condom.*” Some of them did not interfere with older FSWs’ decision to use condoms; therefore, the decision regarding condom use was usually made by older FSWs themselves. A 40-year-old FSW (Nanning, venue-based) described the situation, “*Our boss usually lets us do it per our own wishes and she does not care if we use condoms*”.

Although norms towards condom use existed among pimps, venue owners, and bosses, their role in condom use was contradictory. On the one hand, their employee’s wellbeing was a concern, as healthy workers were important assets to the success of their business. On the other hand, to retain clients and receive more clients by referral, their goal was to ensure their customers were satisfied. As a 36-year-old FSW (Hefei, venue-based) noted, “*The boss does not care about condom use. She only cares about earning money. She is very kind to sex workers who do not use condoms because they bring her more clients.*” As a result, pimps,’ venue owners,’ and bosses’ attitudes towards condom use were mixed.

Although pimps,’ venue owners,’ and bosses’ attitude towards condom use varied, they supported free HIV/STIs prevention activities and even informed older FSWs of the availability of these services. As two venue owners from Qingdao said, “*The local CDC*

*provides health activities and services to sex workers” (female, 55 years old, owner of the roadside venue), “We trust CDC and tell them about our business (sex work) since they frequently provide free condoms and other free services, such as HIV or syphilis testing” (male, 36 years old, owner of the roadside hair salon). Some older FSWs noted that pimps, venue owners, and bosses were their primary source of information on HIV-related services. A 36-year-old FSW mentioned, “My boss sometimes talks to us about HIV. All the information about HIV I know is from her. She took us to the local CDC for HIV testing last year. Last month, I took part in the class for self-health care organized by the local CDC. It was my boss who informed me of that class” (Hefei, venue-based).*

## Discussion

The findings document two main types of social networks with different relations and functions among older FSWs: the family network and the workplace network. Depending on the network structures, relations, and functions (support and norms), network factors negatively or positively influenced older FSWs’ engagement in safer sex.

Older FSWs were strongly influenced by their family network needs and turned to sex work to make enough money. We identified that older FSWs’ familial burden, emotional intimacy, and responsibility put them in a vulnerable situation for HIV infection. This study together with previous research demonstrates that financial necessity often results in engagement in condomless behavior (Huang et al., 2004; Sherman, Lilleston, & Reuben, 2011). Our findings showed that raising children motivates older FSWs to engage in more risky sexual behavior to make money. Clearly, older FSWs had two distinct roles. As mothers, they were required to take family responsibility and protect their family’s dignity. As sex workers, they focused on serving more clients to make more money. In this scenario, condom use became a competing interest.

Condom use was dictated and negatively influenced by clients in workplace networks. Older FSW-client relations were business ties only, with limited access to emotional or tangible support. Because of financial necessity for the FSW, clients’ preference for condomless sex was the most important determinant of condom use. Older FSWs reported that the majority of their clients were migrant workers and older men. Older men were perceived to have a low risk for acquiring HIV infection. However, in reality, the proportion of new cases of HIV/AIDS has increased dramatically in both rural-to-urban migrants and older adults who are 50 years old or older in China (Liu et al., 2012; L. Zhang, Chow, Jahn, Kraemer, & Wilson, 2013). It is likely that the recent epidemic is partly attributed to condomless sex between older FSWs and their clients.

Comprehensive HIV interventions should focus on risk perception in older FSWs, communication skills to negotiate with their clients, and assistance with older clients’ erectile problems, such as use of lubricants with condoms to increase sexual pleasure (Rojanapithayakorn & Goedken, 1995). Promoting and training older FSWs to use female condoms (FC) is another option for them to avoid the negative influence from clients. However, the FC is rarely introduced or promoted in China, even in the national family planning programs, and this method currently might not be considered an alternative option

for all FSW in China. Liao et al. (2011) used an intervention to promote FC use among FSWs, but only 25%–50% of participants reported using FC during the intervention and only 10%–30% reported using FC more than once after the intervention. FC provide effective protection from STIs and could be more widely promoted among FSWs (Holmes, Levine & Weaver, 2004).

Older FSWs who had frequent contact with peers were positively influenced to use condoms by other FSWs. Other studies have found that frequent connections in the network have provided powerful support for condom use among FSWs. For example, results from a peer education program in Bangladesh suggested that social support from peer educators was related to high self-reported condom use among sex workers (Sarafian, 2012); similar findings have been reported in China (Gu et al., 2009; Tucker et al., 2011). In this study, however, a small proportion of older FSWs who lived with their families did not maintain strong relations with their peers, socially isolating them and inhibiting access to social support. Those who were socially isolated may be at a higher risk for HIV infection than those who have more network ties with their peers. Future HIV interventions should target this group of older FSWs.

In general, network function and relations with pimps, venue owners, and bosses had a relatively positive influence on condom use among older FSWs. Chen et al. (2012) found that hierarchical network communications from venue owners to sex workers were efficient in diffusing HIV intervention information. Pimps, venue owners, and bosses are uniquely positioned to facilitate sex worker engagement in HIV intervention activities. Past research has shown that this is an essential element to the success of health interventions in China (Ma et al., 2012; Wong, 2001).

In this study, supportive social networks (e.g., work-related networks) led to some positive outcomes, such as shared knowledge about HIV/STIs and HIV/STI-related services. One recent study on FSWs in China reported an association between consistent condom use and peer support (Yang & Xia, 2013). The authors, however, did not conduct a social network analysis, so it is unknown if the decision to use condoms consistently was also influenced by owners' or pimps' support in their work networks. In our qualitative study, the effect of peer and owner/pimp support on condom use appeared to have little influence on actual behavior change. However, workplace networks were not purely supportive and competing risks factored into the ultimate decision to use condoms, such as competition between sex workers and pressure from owners, pimps, and managers to provide more business. Work-based supportive networks in this case have conflicting influences on condom use. Future studies should determine if leveraging this type of network is effective at increasing condom use and other preventive HIV/STI behaviors.

Previous research has reported that low-end sex workers are often socially isolated from their occupational support networks (C. Zhang et al., 2013; Seib, Fischer, & Najman, 2009). Our study is consistent with these findings, demonstrating that isolated older FSWs reported smaller social networks and less contact with other sex workers. Constrictive social networks may put older FSWs at a disadvantage by constraining the diffusion of information, ideas, and behaviors. Although older FSWs purposefully constrict their

occupational networks for strategic reasons, they limit incoming information from their work network, leading to poor uptake of HIV preventive behaviors, such as condom use. Clearly, the benefits of occupational secrecy to protect themselves and their family's identity from social shaming outweighed the benefits of information exchange and work network support.

However, a constrictive network does not necessarily lead to negative consequences or behaviors. Older FSWs who limit interactions with their occupational network may have the opportunity to exhibit more independence in their work. This might result in less negative pressure from pimps, venue owners, and bosses to provide sex services without condoms and the freedom to practice selectivity about the clientele they provide sex services to, potentially putting them at lower risk for violence and other forced behaviors by clients such as drug use and condomless sex. More research should be done to determine if constrictive commercial sex networks can lead to safe sex behaviors.

Future interventions targeting venue-based older FSWs can utilize stakeholder (pimps, venue owners, and bosses) leadership within the workplace network to improve uptake and retention into HIV related programs. Although support for condom use existed among pimps, venue owners, and bosses, this support was counterbalanced by business opportunities to make additional profit from condom nonuse. Future HIV interventions for stakeholders and older FSWs should consider the health consequences from a business model perspective (e.g., higher turnover, lost productivity, etc.).

These findings should be viewed in light of several limitations. All measures of sexual behavior were based on self-report; however, efforts were made to minimize bias (e.g., anonymity, interviewer training). The relationship of network structures and functions might not be accurately described from this qualitative perspective; further quantitative research should be conducted. Recruitment occurred through pimps or owners' referrals and therefore, FSWs with poor relationships with pimps or owners may not have been recruited into the study. Those who enrolled may have had closer relationships with pimps or owners and therefore may have been different from other older FSWs. Because of this, older FSWs in this sample may have reported a higher level of positive influence from pimps, venue owners, and bosses on condom use than FSWs not recruited into the study.

Despite these limitations, this study advances our knowledge and understanding of older FSWs' social and sexual networks and their associations with safer sex. Furthermore, it demonstrates that different relationships in the family and workplace networks can negatively or positively influence condom use. Finally, we identified older FSWs' extreme vulnerability to acquire and transmit HIV through social networks, particularly related to the responsibility to their children, characteristics of social isolation, and relationships with clients, peers and pimps/owners. These findings will facilitate the development of network-based HIV interventions for older FSWs in China and other countries.

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## Appendix: Abridged interview guides for in-depth interviews and focus group guide

### In-depth Interview Guide

#### Sex work structure and organization

##### 1 How did you get into this work?

Probe: (1) How did you first hear about the opportunity? (2) From friends or others? If so, who were they? What did they say?

##### 2 What were the reasons that you decided to work as a sex worker?

Probe: (1) Economic reasons? (2) Allured or forced to enter sex work? If so, who, why, and how? (3) Other reasons?

##### 3 Please describe how your work is organized?

Probe: (1) Who is the organizer (pimp or others)? (2) How do you communicate with pimps or others? (3) How is your work monitored? (4) From whom you are able to obtain support?

##### 6 Please tell me where you provide services to clients

Probe: (1) Please describe the location (street, park, hotel room, or other place). (2) Who usually designates the location of sex performance, you, your clients, or

pimps? (3) Do the owners of the place (say, hotel managers) know that you have sex with your clients in their place? If so, what is their reaction? (4) Are condoms provided in the location? If so, are they free or who provides them (pimps or owners)?

**7 Can you tell me a little about your friends who are also sex workers?**

Probe: (1) Do you meet them daily? What do you usually do if you hang around with them? (2) Are you close friends with any of them? (3) Is there competition among them? (4) Did you know any of them before you came and from where did you know them?

**9 What do you feel about sex work?**

Probe: (1) Describe both the good and bad aspects of being a sex worker. (2) What kind of risks do you face with regard to your physical health and security? (3) What kind of risks do you face with regard to your emotional health and well-being?

**10 What kinds of problems have you encountered while working as sex worker?**

Probe: Problems in relation to pimps / manager / other sex workers / community / relationships / children / husband.

**11 Have you worked with a pimp? If so:**

Probe: (1) How do you know this pimp? (2) How do you interact with your pimp? (3) How does your pimp work with you (protect, support, monitor, intervene)? (4) Has the pimp discussed STDs or HIV with you? (7) What is his /her opinion or attitudes to condom use? (5) If clients do not want to use condoms, what does the pimp do? (9) Does the pimp provide free condoms to sex workers?

**Regular partners or husbands**

**1. Are you married or in a serious relationship?**

Probe: Can you tell me about your relationship with this person?

**2. Have you and your boyfriend/husband talked about condom use?**

Probe: Can you tell me about your discussions?

**3. Do you use condoms with him now?**

Probe: For what purpose (prevent pregnancy or diseases)?

**4. Does your husband know your job is sex work?**

If so, what was his reaction?

**Information about your clients**

**1. Next, I want to know something about your clients:**



Probe: (1) On average, how many clients per night or week do you have? (2) What do your clients look like (age, well-educated, job, economic status, etc)? (3) Where do they come from?

**2. Please tell me more information about condom use with your clients.**

Probe: (1) How often do you use condoms (every sex act, always, often, sometimes, never)? (2) Do you usually ask to use condoms or are you asked by your clients? What kinds of clients ask to use condoms? (3) What characteristics do the clients who do not want to use condoms have and what are their reasons for not wanting to use condoms? (5) How do you negotiate condom use with them? (6) Are you afraid that your clients will not do business with you if you insist on condom use? (7) What approaches do you usually use to persuade your clients to use condoms?

**Social network**

**1. Who do you spend a lot of time with?**

Probes: (1) Do these people live in your neighborhood? (2) Are these people sex workers? (3) Are these people your close friends? If not, who are your close friends?

**2. What are your preferable activities when you are with your friends?**

Probes: Ask respondents about social, economic, or material activities they had in the recent week, followed by the recent month and the level of social support they received from others, specifically around HIV/STI prevention and medical needs.

**3. How would you describe your relationship with your friends?**

Probes: (1) Tell me about your friends (who are they?), (2) Are they sex workers? If so, did they start working as sex workers before you or after you? (3) Who do you usually talk to when you are upset about something?

**4. Have you ever talked to any of these friends about condom use?**

Probes: (1) What do you usually talk about? (2) Have you encouraged them to use condoms? (3) Have you been encouraged by them to use condoms? (3) What resources and support systems do they have that can help facilitate condom use/ safer sex practices?

**Interview guide for Focus Groups**

**Sex work in your area**

1. As you know there are many female sex workers in this city. What are our society's beliefs and attitudes towards older sex workers (35 years old or older)? By society, I mean the general people in the city.
2. Based on your observations, do you think the number of older female sex workers has increased in the past three years? If your answer is "yes," what do you believe the reasons are for this increase?

3. What are the common places that older female sex workers solicit clients and provide sex services?
4. Who are the older sex workers (age, occupation, marital status, income)? Do sex workers migrate from other provinces? If there is a great deal of migration, what provinces do they come from? Please list main reasons that they become to be sex workers?
5. Do the local health officials try to help older sex workers in terms of their health? If so, how?
6. Sexually transmitted diseases (such as syphilis and gonorrhea) are relatively common among sex workers. Are these types of STDs also common in older sex workers? Do older sex workers go to STD clinics for medical treatment? Do they receive exams? If not, what barriers exist (e.g., stigma for being identified as a commercial sex worker)?
7. Let's talk about condom use. Can you tell us your attitudes towards condom use? Do you encourage them to use condoms? If so, how? Are there any policies about condom use that are currently in place and how are they enforced? What are the main barriers to condom use? How can you help reduce barriers to condom use? Do you happen to know other managers' and owners' attitudes toward condom use? If so, please tell me?
8. Are condoms frequently used among older female sex workers? How and where do older female sex workers get condoms? Are condoms available in venues where sex workers provide sexual services?

### **Older sex workers under your supervision**

1. How often do new groups of older sex workers come to work under your supervision? What is their average length of stay?
2. Can you describe your relationship with older female sex workers? What kinds of support do sex workers seek from their owners or managers? What kinds of support do owners or managers provide for older sex workers?
3. As a team leader or manager, how are you involved in the management of their sex services?
4. Where do they solicit their clients? About how many places in this city? Where do they have sex with clients?
5. How do you care for their health? How often do sex workers receive medical exams for STDs? What percentage of medical visits, would you say, are kept over a one month period?
6. What is your policy about educating sex workers? What rules/regulations towards education do you have in place?
7. How do older sex workers pay for condoms and medical exams? Do managers or owners pay for condoms and/or medical costs for sex workers?

8. How knowledgeable are managers or owners about HIV infection or condoms?  
How do managers help facilitate condom use? If clients do not want to use condoms, how do they intervene?

**Table 1**

Social networks and their influences on condom use among older female sex workers

Social networks	Descriptions of each relationship	Influences on condom use
Family network		
Children	<p>Relation Responsible for the provision of material support and emotional support to their children</p> <p>Structure Older FSW was the only provider of the dependent child</p> <p>Function Child was the main concern of older FSW</p> <p>Major source of financial burden</p> <p>Mental burden: conflicts related to the dual role of mother and sex worker; concealment of sex worker identity; guilt; insecurity</p>	Creates ineffective social support for condom use, because it reduced older FSWs' ability to negotiate condom use with their clients
Husbands	<p>Relation Weak marriage relationship</p> <p>Structure Physically separated</p> <p>Function Concealed</p> <p>Source of financial burden for older FSWs</p>	<p>Non-condom use with husbands</p> <p>For those who did not disclose their sex worker identity: non-condom use was sign of loyalty</p> <p>For those who disclose their sex worker identity: trust misled their husband into non-condom use</p>
Workplace network		
A. Supportive networks		
Peers who were also sex workers	<p>Relation Larger network size</p> <p>Structure Frequent contact</p> <p>Function High density network in working venue</p> <p>Tangible support, emotional support, and informational support on condom use and HIV-related prevention</p> <p>Norms regarding condom use were relatively well established among FSW peers</p>	Older FSWs who were socially involved with peers: accessed HIV/STI related informational support, tangible support, and emotional support
B. Constrictive networks		
Socially isolated FSWs	<p>Relation and structure Socially isolated older FSWs: lived with their family members, rarely contacted with peers</p> <p>Function Socially isolated; no support from outside</p>	Socially isolated older FSWs: less social support from peers, less access to HIV/STI preventive information
Clients	<p>Relation A one-time sexual and business relationship</p> <p>Structure Unequal transaction</p> <p>Function Low income clients, including migrant workers, and aged men</p> <p>Greater supply of sex workers than clients' demand</p> <p>Ineffective social supports on condom use</p> <p>Norms regarding condom use were not well established</p>	<p>Sometimes clients and sex workers defined better sex services as equating to condomless sex</p> <p>Coupled with the strong intention to earn money, older FSWs provided condomless sex if they were paid additional money from clients</p>

Social networks	Descriptions of each relationship	Influences on condom use
Pimps or venue owners	<ul style="list-style-type: none"> <li>Relation</li> <li>Reciprocal beneficial business relationship</li> <li>Supervisors and subordinates</li> <li>Structure</li> <li>Frequently contacted in the venues</li> <li>One pimp or venue owners with more than one sex worker</li> <li>Function</li> <li>Attitude towards condom use varied among pimps and venue owners</li> <li>Supports for HIV-related preventive program</li> </ul>	Pimps and venue owners' attitude towards condom use varied and mixed