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Knowledge, attitudes, perceived vulnerability of Chinese nurses and their preferences for caring for HIV-positive individuals: a cross-sectional survey

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Abstract

Aims—The study was to assess HIV/AIDS knowledge, attitudes and perceived vulnerability with potential factors.

Background—HIV/AIDS is a public health catastrophe in China. Nurses are expected to care for nurture, comfort and advocate for all patients regardless of their condition. However, in the area of HIV/AIDS, nurses suffer as a result of expectations put on them by their professional roles.

Design—This was a descriptive, cross-sectional design that used a survey approach.

Method—Data were collected from Summer 2003–Winter 2004.

Results—Nurses reported significant perceived severity of risk from occupational exposure. Many nurses were frequently exposed to being stuck by needles (86%) and being splashed by body fluids and more than half of them (59.7%) were concerned about contracting HIV/AIDS. Nurses who had experience of finger pricks worried about potentially contacting HIV and being unaware of it (odds ratio= 0.444, $p = 0.004$). Nurses demonstrated a lack of knowledge and training in infectious diseases which may be a result of the fact that the study location is not considered a ‘concentrated area’ for infectious disease transmission; therefore, the need for the infectious diseases training has not been considered urgent.

Conclusions—A well-designed educational programme on occupational hazards and risk behaviour should be implemented to educate nurses in suburban cities and the general public. Hospital administrators should implement on-site continuing education on HIV/AIDS throughout China. Armed with better knowledge of both transmission routes and precautions, nurses can protect themselves while providing care to patients.

Relevance to clinical practice—Nurses in China urgently need psychosocial and physical supports from families, friends, communities and their working environments while combating HIV epidemic. With good support system, nurses will better educate patients and their family

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Contributions

Study design: WC; data collection and analysis: WC, HM and manuscript preparation: WC, HM.

Conflict of interest

None.

members on how to prevent transmission not only of HIV/AIDS but of a wide range of other infectious diseases as well.

Keywords

attitude; caring; China; HIV/AIDS; knowledge; nurses; perceived vulnerability

Introduction

HIV/AIDS is a public health catastrophe in China (Ministry of Health People's Republic of China and Joint United Nations Programme on HIV/AIDS & World Health Organization 2009). As of the end of 2007, an estimated 0.7 million HIV-infected individuals were reported by the Ministry of Health (Gill & Okie 2007, Gill et al. 2007). Increasing numbers of women in China are becoming infected by HIV, as demonstrated by the increase in the male/female ratio from 9:1 in 1990–1995 to 4:1 in 2001 (UNAIDS 2006). There has also been an increase among pregnant women in high-risk areas, where HIV prevalence has grown from nil in 1997 to 0.26% in 2004 (Gill & Okie 2007, Gill et al. 2007).

The first reported AIDS case in China was in 1985 (Zhang et al. 2007), and it was estimated that there were 840,000 people living with HIV, of whom 80,000 had developed AIDS, by the end of 2003 (UNAIDS/WHO 2009). Of reported cases, approximately 75% are men and 81% are 15–39 years of age (UNAIDS/WHO 2009). While overall numbers of persons infected with HIV in China appear to be lower than expected, official estimates reveal that the country had 70,000 new infections in 2005, which represents about 200 new infections per day (Gill & Okie 2007). The epidemic has spread to all 31 of China's provinces, and the country has witnessed a rapid increase in HIV infections, especially from intravenous drug users (IDUs) and sexual transmission (Gill & Okie 2007).

Currently, there are limited studies focused on nurses' knowledge, attitudes and perceived vulnerability towards HIV/AIDS in China. Nurses are expected to care for nurture, comfort and advocate for all patients (Brown 2004) regardless of their condition. However, in the area of HIV/AIDS, which involves stigma and discrimination in Chinese society, nurses suffer as a result of expectations put on them by their professional roles. At the same time as they treat their patients, they need to face their own fear of the disease. Studies have shown that health care providers suffer discrimination as result of their role as caregivers to patients with HIV/AIDS (Li et al. 2007a,b, 2008).

After more than two decades of caring for patients with HIV/AIDS, nurses in developed countries have changed their attitudes dramatically and have adopted a much more active form of caring for PLWHA (Rondahl et al. 2003, 2004). With continuing HIV-related medical education and experience, health care providers gradually express increased willingness to take care of patients with HIV (Liljestrand 2004). Conversely, in developing countries like China, nurses have shown a reluctance to care for HIV-positive patients (Chen et al. 2004, Williams et al. 2006, Dent 2007). Ironically, in these countries, the more nurses know about HIV, the more they avoid taking care of PLWHA (Ehlers 2006). Reports from other countries have shown that health care providers there are seriously concerned about their risk of occupational infection with HIV (Kermode et al. 2005, Chan et al. 2009). Nurses in India, for example, who have experience taking care of HIV-positive individuals, were willing to play an active role in HIV care, even though they were still worried about potential infection (Kermode et al. 2005). In Thailand, nurses revealed that, notwithstanding their knowledge that they had a low probability of contracting HIV through occupational exposure, the fear of HIV infection remained and was largely driven by the predictable

social consequences (as opposed to health consequences) of being HIV positive, including stigma and social isolation (Chan et al. 2009).

The purpose of this study is to assess nurses' knowledge, attitudes and perceived HIV/AIDS vulnerability at the First Affiliated Hospital of Jiamusi University (FAHJU) in Heilongjiang Province, China. Currently, there are few HIV prevention programmes in northeastern China, because the HIV/AIDS epidemic in this region has not attracted sufficient attention from the authorities.

Conceptual framework

This study was guided theoretically by a modified version of the Health Belief Model (HBM) (Rosenstock et al. 1988, Mikhail & Petro-Nustas 2001). HBM is an ideal theoretical model for assessing perceived vulnerability and has been widely used for assessing risk in cancer, tuberculosis and other infectious diseases (Rosenstock et al. 1988, Mikhail & Petro-Nustas 2001, Lin et al. 2005). The model postulates that individuals' health behaviour is a function of the following: (1) Cue-to-action: personal demographic data that triggers the individual to act on her beliefs; (2) Perceived severity: the perceived seriousness of the health threat; (3) Perceived benefits: the belief that knowledge of HIV/STIs can reduce susceptibility and severity; (4) Perceived barriers: attitudes towards condom use as HIV/AIDS prevention; (5) Perceived susceptibility: the individual's perceived vulnerability to HIV/STIs (Mikhail & Petro-Nustas 2001, Poss 2001, Yarbrough & Braden 2001). This modified HBM construct can help to estimate people's perceived vulnerability and to develop educational interventions for women who are at risk of HIV/STI.

Methods

A descriptive cross-sectional design was used in combination with a survey. Recruited participants were nursing staff currently working at the FAHJU, Heilongjiang Province, China.

Ethical considerations

The study was approved by the institutional review boards in University of California at San Francisco and FAHJU.

Data collection and sampling

Study inclusion criteria required that each participant was (1) currently working as a nurse at FAHJU, (2) able to understand and sign a consent form, (3) able to complete the study survey, (4) able to read and write Mandarin and (5) at least 18 years of age. The study was conducted from late 2003 to early 2004.

In this study, 177 nurses were recruited, which was a 95% return rate for the 186 nurses encountered. Study consent forms were signed before participants filled out the survey. Data were collected using a standardised questionnaire. There were 88 questions in this survey, all of which focused on nurses' knowledge of and attitudes towards caring for HIV/AIDS patients' and nurses' perceived vulnerability of infection with HIV/AIDS.

Study setting

FAHJU is a premier teaching hospital in Jiamusi City, Heilongjiang Province. Currently, there are approximately 470 nurses working at the facility. Many surrounding community hospitals refer their patients to FAHJU; if a patient cannot be treated in FAHJU, the patient will be directly referred to the government hospital in Beijing for more intensive care.

Study instruments

The study instruments were focused on several aspects of the disease, including (1) general knowledge of HIV transmission routes, (2) general attitudes and behaviours towards high-risk behaviours, (3) health care providers' perceptions and attitudes towards HIV-positive patients and (4) demographic data. The detail study instrument has been discussed in a separate paper (Chen et al. 2004, 2008). Statistical Package in Social Science (SPSS Inc., Chicago, IL, USA), Version 15, was used to analyse the correlation and descriptive data of this study.

Results

The average age of the participants was 37.42 years with an average time of working as a nurse of more than a decade (mean = 16.63 year, range from 11–20 years). Most participants (82%) were married or living with a partner and had an annual income of between 5000–9000 RMB (\$625–\$1125) per year. Fifty-four per cent had completed nursing at a two-year college and 81.4% worked as staff nurses (Table 1).

Nurses' HIV knowledge and perceived vulnerability

Twelve standard questions were used to evaluate nurses' knowledge related to HIV/AIDS transmission. Detailed survey questions and answers are presented in Table 2 with perceived HIV vulnerability. The reliability coefficient Cronbach's alpha was 0.70 in HIV knowledge assessments for the current study (Chen et al. 2004), which is similar to another study (Wang et al. 2001). Most nurses were able to identify potential sources of HIV infection correctly, including unprotected sex, needle sharing and transfusions using infected blood. However, many nurses still demonstrated inadequate knowledge regarding transmission pathways. A significant proportion of the nurses (66.7%) reported that their understanding of the term 'HIV positive' is the same as that for the term 'AIDS.' Also, 75.1% of the nurses believed that a person can be infected with AIDS by eating in a restaurant where a restaurant worker had HIV/AIDS, while 64.4% reported a belief that HIV could be transmitted by public toilets or from swimming in a pool with someone who was infected (52%).

More than half nurses (52%) reported significantly perceived severity of risk from occupational exposure. A large number of them (86%) had been stuck by needles of the nurses (59.7%) worried that they might contract HIV/AIDS or that their spouse might contract it (36.7%) if the spouse was out of town very often. Chinese nurses in this study (73.4%) expressed that if they were diagnosed with HIV/AIDS, they would seek a detailed exam; however, only 45.8% of them expressed that they would avoid sexual contact if they were confirmed to have HIV.

Attitudes towards HIV

Nine items evaluated nurses' attitudes towards patients with HIV/AIDS. The mean score of these questions was 6.34 (SD 2.20). The reliability coefficient Cronbach's alpha was 0.73 in this study. In their answer to these survey questions, nurses expressed significant discomfort in counselling patients on HIV risk prevention. Forty-four per cent of the nurses felt that HIV-positive patients should be quarantined.

Perceived HIV vulnerability and HIV community susceptibility

An attempt was made to assess the nurses' perceived personal HIV vulnerability by asking whether they worry that they might be infected with HIV but not know about it; the answer could be either 'yes' or 'no'.

Other survey questions are related to nurses' perceptions of their communities' susceptibility to HIV infection. Because of the conservative nature of many Chinese, these questions were designed so as to avoid asking directly about personal experiences, focusing instead on whether the nurses had heard about others practicing risky behaviours. The nurses' responses demonstrated their perception of several factors (sexual activity among cohabitating couples in the community, use of hypodermic needles, use of prostitution and people selling blood) in relation to the community susceptibility.

Risk and perceptions

Nurses who perceived themselves to have a high risk of contracting HIV/AIDS tended to have higher chances of getting finger sticks ($r = 0.21$, $p < 0.01$), tended to have a lower nursing rank ($r = -0.18$, $p < 0.05$), were likely to be aware of illicit drug use in the community ($r = 0.16$, $p < 0.05$), knew there were people selling blood in the community ($r = 0.03$, $p < 0.01$) and did not think extramarital affairs were common in their communities ($r = -0.16$, $p < 0.05$). Nurses who had experienced finger sticks also reported having a higher chance of being splashed by patients' body fluid ($r = 0.23$, $p < 0.01$).

Vulnerability predictors

Only one significant predictor was related to the perceived vulnerability of HIV: finger sticks experience (OR = 0.444, $p = 0.004$). However, the logistic regression model did show trends among the predictors. Nurses who had higher positions relative to newly graduated nurses, for example, felt less vulnerability to HIV infection (OR = -0.009, $p = 0.07$). Similarly, participants who had better HIV-related knowledge showed lower perceived vulnerability of contracting HIV (OR = -0.043, $p = 0.11$). Table 3 presents the predictors related to HIV vulnerability.

Discussion

The current study shows that nurses are frequently exposed to needle sticks and splashed by body fluid but is not aware of the potential risk of infection, while some nurses who have experienced finger pricks are especially worried about potentially contracting HIV and being unaware of it. The experience of being splashed by patient body fluids was not significant in the regression model, possibly because few nurses experience body fluid splashes other than those nurses working in the emergency room or the labour and delivery room. This is similar to the experience of nurses in several African countries, where patients' HIV status remains unknown. In those countries, nurses might not always use adequate protection (Ehlers 2006). Currently, there is no 'universal precaution' protocol implemented at FAHJU. However, as nurses have begun to learn more about the possibility of airborne infection following the SARS epidemic, they are also gradually becoming aware of the transmission of other infectious disease, like HIV/AIDS. During the SARS epidemic, the government required every health care provider to attend training sessions related to SARS treatment and prevention. The SARS experience became an important model for designing future educational programmes focusing on nurses' occupational hazards, particularly with regard to HIV transmission prevention.

Education programmes on sex and sexually transmitted disease, like HIV/AIDS, are not popular in China. In the general population, recommendations regarding safe sex and condom use among Chinese college students (18–22 years old) have not been widely accepted (Hong et al. 2007). Currently, there is no standard sex education curriculum in most Chinese middle and high schools (Hong et al. 2007, Chen & Peng 2008). Although there is a course on 'physiology and hygiene' that is given to all students in junior high school (age 12–15 years old), the course is not oriented towards sex education and disease

prevention. Teachers often skip sex-related content (for example, puberty and reproductive health) in instruction or present these subjects to students as self-learning assignments (Hong et al. 2007, Chen & Peng 2008).

A similar situation exists in nursing education. Many nurses, even after going through a three- or four-year nursing programme, could not consistently demonstrate that they had a systematic education in reproductive health and infectious diseases (Burgess et al. 2001). In many cases, nursing school faculties skip reproductive health altogether because of the constraints of conservative Chinese culture. It is not acceptable to discuss human anatomy or sexual function in public; therefore, even nursing students must learn about the human reproductive system from friends and/or family. In this study, nurses demonstrated fair knowledge (mean = 6.66) about HIV transmission. Significantly, participants who had better HIV-related knowledge had shown less perceived vulnerability of contracting HIV, which is similar to the findings of other researchers (Sallar 2009, Gagnon et al. 2010). The relative lack of knowledge and training in Jiamusi may be a result of the fact that suburban cities like Jiamusi are not considered 'concentrated areas' for infectious disease transmission training.

This study also demonstrates that lower-ranked nurses have experienced more finger pricks and perceived higher risk of getting HIV. This might be because these nurses do not have the chance to receive continuing education on site – even for those who might have worked as nurses' aides for years. Furthermore, nurses who had a higher position, when compared to newly graduated nurses, felt less vulnerability to HIV infection. This might be because many experienced nurses were working in the administrative roles which do not require bedside patient care; therefore, they do not perceive a risk of being exposed to HIV infection. Current study shown that nurses who had a higher perceived vulnerability of HIV infection at work, more prejudicial attitudes towards people living with HIV/AIDS and/or previous contact with HIV patients were more likely to prefer HIV sero-status testing for all patients admitted to the hospital. This is similar to other literature which had shown that nurses' attitudes towards patients care were often negatively reflected on the provider–patient relationship, especially for patients who have shown their preferences of sexual orientation (Hayter 1996).

Chinese nurses have expressed frustration and job dissatisfaction related to a perception that they can provide only physical care to their patients and cannot broaden their nursing practice to include psychosocial care as well (Lu et al. 2008). Integrating the Internet into a programme to conduct long-distance continuing education would be a good way to update professional knowledge among Chinese nurses (Cragg et al. 2003). However, with limited access to up-to-date nursing knowledge and lack of on-the-job training, nurses in China will continue to experience difficulty advancing the profession.

The nursing profession in China has developed greatly in recent years. For several years, hospitals in China have been collaborating with international nursing scholars to train nurses in universal precaution methodology (Burgess et al. 2001, Wang et al. 2003). As their experience with infection diseases grows, nursing faculties in China are scaling up their communication and research skills dramatically and elevating the quality of nursing care they provide (Lu et al. 2008, Li et al. 2009). Hospital administrators in different regions of China are learning to share their experience to adopt better protective equipment and to implement universal precaution skills for nurses while providing bedside care.

The Chinese government is starting to address the HIV/AIDS issue through new kinds of training programmes in larger cities (Sun et al. 2007, Wang et al. 2007, Wu et al. 2007); however, suburban and rural areas where fewer HIV-positive cases have been reported should also be included in these programmes. Many Chinese women have become infected

with HIV/AIDS in recent years (Gill & Okie 2007, Gill et al. 2007). Most nurses are women.

As such, they are aware of their social environment and know that the society is developing very rapidly. These women are gaining much new knowledge, including knowledge of high-risk sexual behaviour in their communities. As the current study shows, cohabitation among young people, premarital and extramarital sexual encounters, prostitution, illegal drug use and improperly regulated (or unregulated) blood sales were all present in the target neighbourhood. Although respondents seldom indicated that they had personally engaged in risky behaviour, all the study participants reported at least knowing someone who had.

China is a conservative nation, where talking about sex in public is not common. However, over time the younger generation is being ever more deeply influenced by Western culture, resulting in an ever lower age for engaging in sex. Several studies have reported that premarital sexual contact is now somewhat common among adolescents, especially in the urban areas (He et al. 2009, Nie 2009). Another indication of the increase in premarital sexual activity in China is the abortion rate among teenage women. In Shanghai, the abortion rate for 15- to 19-year-olds was 56/1000 in 1988 (Cook & Dickens 2002), and in China overall, teenagers in rural areas have higher rates of abortion compared to urban teenagers, at 72/1000 and 46/1000, respectively (Cook & Dickens 2002). This statistic implies that teenagers in rural areas might have less access to contraception than their urban counterparts. With a permanent pool of 100 million migrant workers seeking construction work in metropolitan areas for upcoming international events and the economic opportunities associated with them, risky sexual behaviour has become more common.

Limitations

There are several limitations to this study. First, the study is limited to nurses from a single institution in a suburban area. Further studies should be conducted in hospitals in rural, suburban and urban areas, areas that would present a broader spectrum of nurses' knowledge and attitudes towards HIV/AIDS in their working environments and neighbourhoods. Second, some nurses did not complete all of the questions related to HIV/AIDS transmission. This might have been attributed to a reluctance to reveal insufficient knowledge, or it could have been attributed to other, personal reasons. Third, this study used cross-sectional convenience sampling that cannot be generalised to other nurses in China. Study results might therefore have been skewed in the sense that those who participated in this study might have been more confident in their knowledge of HIV/AIDS when compared to those who chose not to participate.

Relevance to clinical practice

Hospital administrators should implement on-site continuing education on infectious diseases including HIV/AIDS in health care facilities throughout China. A well-designed educational programme on occupational hazards and risk behaviour should be implemented to educate not only nurses in suburban cities like Jiamusi but the general public as well. Also, integrating the Internet into a programme to conduct long-distance continuing education would be a good way to update professional knowledge including HIV-related issues and universal precaution among Chinese nurses.

Conclusions

HIV-positive persons are present in all 31 provinces of China (Gill et al. 2007), and as a result, nurses will have more chances to encounter these patients. A well-designed educational programme on occupational hazard and risk behaviour should be implemented

not only to educate nurses in suburban cities like Jiamusi but also to educate the public at large. Nurses need psychosocial and physical supports from families, friends, communities and their working environments. At the same time, nurses can better educate patients and their family members on how to prevent transmission not only of HIV/AIDS but of a wide range of other diseases as well.

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Table 1

Demographic background

	SD	Mean	n (%)[*]
Age	8.660	37.42	
20–29 year			31 (19.5)
30–39 year			80 (50.3)
40–49 year			38 (23.9)
50–59 year			9 (5.7)
60 and up			61 (53)
Sex			
Female			173 (97.7)
Ethnic group			
Han			166 (93.8)
Education level			
Vocational junior high school			38 (22.6)
Two-year college			91 (53.8)
Four-year college			40 (23.7)
Marital status			
Married			145 (84.3)
Position			
Nurse			144 (81.8)
Nursing supervisor			29 (16.5)
Working experiences	8.605	16.63	
0–5 year			19 (11.7)
6–10 year			19 (11.7)
11–20 year			82 (50.3)
21–30 year			30 (18.4)
31 and above			13 (7.97)
Income	3368.057	7476 RMB	
1000–4999 RMB (~\$125–\$625)			20 (13.9)
5000–9999 RMB (~\$625–\$1250)			80 (55.5)
10 000 and above (~\$1250 and up)			44 (30.5)
Have tap water at home			167 (94.4)
Have a shower room at home			83 (46.9)
Have a private toilet at home			154 (90.6)
Are you worry that you might infect IV but you don't know			
No			87 (47.5)
Yes			91 (52)

* Total *n* = 177, including missing data.

Table 2

Cross-table for correct HIV-related knowledge and concern of infected HIV

Items	Correct answer <i>n</i> (%)	Perceived HIV vulnerability yes (%)
1 AIDS is caused by a virus that damages the human immune system	160 (90.4)	82 (46.3)
2 If a person tests positive for HIV, that means the person has AIDS	118 (66.7)	54 (30.5)
3 A person can get the AIDS virus from having unprotected sex	106 (59.9)	57 (32.2)
4 A person can get the AIDS virus from sharing needles or syringes with others	157 (88.7)	79 (44.6)
5 A person can get the AIDS virus from receiving a blood transfusion	154 (87)	81 (45.8)
6 A woman infected with the AIDS virus can give her unborn child the AIDS virus	168 (94.9)	88 (49.7)
7 Correctly and consistently using condoms is an effective way to prevent getting infected with the AIDS virus during sex	138 (78)	64 (36.2)
8 A person can get the AIDS virus from eating in a restaurant where the cook has AIDS	44 (24.9)	16 (9)
9 A person can get infected with the AIDS virus by using public toilets	63 (35.6)	33 (18.6)
10 A person can get the AIDS virus by shaking hands or touching someone who has AIDS	19 (10.7)	9 (5)
11 A person can get the AIDS virus from swimming in public pools in which HIV-infected people swim	85 (48)	42 (23.7)
12 A person can get the AIDS virus from mosquito bites	85 (48)	42 (23.7)

Table 3

Predictors of HIV vulnerability

Factors	OR	SE	<i>p</i>
Intercept	2.073	0.485	0.000
Nursing position	−0.009	0.005	0.076
HIV knowledge	−0.043	0.027	0.119
HIV-related attitude	−0.001	0.019	0.942
Age	0.003	0.006	0.692
Marital status	−0.169	0.147	0.253
Splash by patients' body fluid	−0.151	0.123	0.222
Finger sticks	0.444	0.151	0.004 [*]

OR, odds ratio; SE, standard error.

^{*} Correlation is significant at the 0.01 level (two-tailed).