

## Gender differences in the perceived self-efficacy of safer HIV practices among polydrug abusers in Taiwan

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### Abstract

Studies have documented that the perceived self-efficacy of attempts to engage in safer behavior is critical for the prevention of blood-borne diseases, including hepatitis C and HIV. The aim of this study was to examine gender differences in the perceived self-efficacy of safer HIV-related behavior among heroin and amphetamine abusers. Of the eligible participants from Taiwan prisons, 1622 polydrug users voluntarily agreed to complete a questionnaire regarding HIV risks. Participants had to be polydrug abusers (amphetamines and heroin), 18 years or older, sexually experienced, and literate. The questionnaire addressed background information, drug abuse, sexual behavior, and perceived self-efficacy in drug- and sex-related HIV risk situations. Twenty-four percent of respondents were HIV positive. Compared to men, women started illicit drug use at a younger age and were less likely to share syringes. Women also tended to have their first sexual coitus at an older age and were less likely to use a condom in their last sexual encounter. Men were more likely to have multiple sexual partners in the past 6 months. Results from a multinomial logistic regression indicate that gender, age, *their interaction*, age of first sexual encounter, HIV knowledge, condom use at last sexual encounter, and multiple sexual partners were associated with perceived self-efficacy of condom use. Results also show that gender, HIV serostatus, HIV knowledge, condom use at last sexual encounter, and sharing needles at last injection were associated with perceived self-efficacy in not sharing needles. The findings provide evidence for gender differences among polydrug abusers in Taiwan regarding perceived self-efficacy in adopting HIV prevention practices. Findings also provide evidence that knowledge about HIV transmission is related to perceived self-efficacy in promoting safe behavior. To raise polydrug abusers' perceived self-efficacy, gender and HIV/AIDS education must be taken into consideration in counseling and/or public health education related to HIV prevention for drug abusers.

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### 1. Introduction

Sharing a contaminated needle and/or having unprotected sex with someone who has a blood-borne disease are the main sources of infectious disease among injection drug users (IDUs), especially in the era of the HIV and hepatitis C virus. Between 2003 and 2006, Taiwan experienced an endemic outbreak of HIV among IDUs, although its

incidence has been declining since methadone treatment and needle exchange programs were launched [1]. Studies indicate that age at first drug use, exchanging sex for drugs, multiple sexual partners, sharing needles, and sex without condoms have been associated with HIV infection among Taiwan IDUs during the last 5 years [2–4]. However, efforts in Taiwan to encourage safer behavior, particularly the use of condoms during coitus, have met with mixed results. One reason may be that the program was not tailored to important characteristics of the IDUs, such as gender [5].

People's confidence in their ability to regulate their own behavior and thereby produce the desired results plays a crucial role in assuring that safer behavior indeed occurs. Studies have documented that perceived self-efficacy regarding these matters is positively associated with reduced drug- and sex-related HIV risk behavior among IDUs (eg, reduced likelihood of sharing syringes

Tony S.H. Lee designed the study, wrote the protocol, collected the data, and drafted the manuscript. Yu-Pei Chen and Chun-Wei Chang contributed to data collection, conducted the statistical analyses, and provided summaries of previous research. All the authors approved the final manuscript.

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and needles and increased frequency of condom use [6,7]). However, a review of the literature sheds no definitive light on whether women have greater perceived self-efficacy regarding condom use than men [8–11]. For example, a study of 873 seronegative or sero-unaware IDUs from New York and Puerto Rico shows that women scored higher than men in perceived self-efficacy regarding low-risk sexual behavior [9]. Likewise, results from another study show that women reported greater perceived self-efficacy than men regarding safer sex practices and less situational temptation for unsafe sex [8]. Other studies, however, have found either that men scored higher than women in perceived self-efficacy regarding condom use or that there were no significant gender differences in perceived self-efficacy. For example, a study of 179 men and 169 women in 4 US cities found no significant gender differences in perceived self-efficacy regarding condom use during vaginal sex [11].

Differences in risk behavior for HIV infection between male and female IDUs have been reported in a few studies [12,13]. However, other studies have failed to find gender differences in the adoption of safer HIV-related practices, including condom use and not sharing syringes [9]. Although more than 60% of HIV cases reported in Taiwan in the last 5 years were associated with drug abuse [1], it is unclear if there are gender differences in perceived self-efficacy regarding condom use and not sharing syringes among drug abusers in Taiwan. Hence, the aim of this study was to investigate such gender differences in Taiwan.

## 2. Methods

### 2.1. Respondents

According to Taiwan's Prevention Act for HIV, prison administrators must provide HIV testing and education to every prisoner. In the past 5 years, more than 67% of the new IDUs testing positive for HIV have been found in prisons [1]. Thus, we recruited incarcerated drug offenders from 7 correctional facilities in Taiwan. Eligible participants were introduced to the purposes and procedures of the study by social workers at each prison. Before the questionnaire was administered, written informed consent was obtained from the participants, all of whom reported drug abuse during the past 6 months and had volunteered to participate. No tangible incentive was offered to the participants. Before data collection, the study had been reviewed and approved by the Human Subjects Institutional Review Board at Taipei Medical University.

The final sample consisted of 1622 participants, all of whom reported polydrug use (amphetamines and heroin) and were 18 years or older, sexually experienced, and literate. Illiterate drug offenders were excluded because they were presumed incapable of completing the questionnaire. Data from 37 original participants with no sexual experience and

513 with no history of heroin injection were excluded from the analyses because they did not have both sexual and injection-related risks.

### 2.2. Measures

The questionnaire asked for background information and included items about risk behavior involving sex and drugs as well as the perceived self-efficacy of safer practices in drug- and sex-related risk situations.

The solicited background information included age, gender, education, HIV serostatus, and knowledge about HIV transmission. Because a minimum of 9 years of education is compulsory in Taiwan, education was categorized as less than 9 years and at least 9 years in school. Knowledge about HIV was measured by 5 items representing the different modes of HIV transmission (ie, sharing needles, unprotected sex, condom use, mother-child transmission, or mosquito bites). Each item was scored "correct" or "not correct"; if the respondents indicated that they were not sure about an item, it was scored not correct.

All participants were asked if they were sexually experienced before the survey. Sexually active participants were asked to answer other questions concerning their sex-related practices. These questions included age at first coitus, condom use in the last encounter, and the number of partners in the 6 months before incarceration. Responses to the item were coded dichotomously as having multiple sexual partners or not. The one item on condom use asked about use in the last sexual encounter (yes/no).

All participants were asked to report if they had injected drugs before the survey. If they answered yes, they were asked about specific drug-related behavior. These items asked about age at first drug use and whether the respondent had shared syringes and needles during the last drug episode (yes/no).

Perceived self-efficacy in the 2 HIV risk situations was measured by 2 items rated dichotomously as confident (1) or not confident (0). The item on condom use was worded as follows: "You are about to have sex with an IDU tonight, and you know unprotected sex may lead you to HIV infection. If you do not want to have sex without a condom, how confident are you that you will use a condom during sex?" The item on sharing needles was worded thusly: "You go out with a group of friends who often inject heroin and get high together. They invite you to share with them. You know that sharing syringes and needles can transmit HIV, but you do not have your own or a new needle with you this time. How confident are you that you can inject drugs without using your friends' needles?"

## 3. Results

### 3.1. Descriptive statistics

Table 1 presents the background information and HIV risk behavior responses of study participants classified by

Table 1  
Demographics, HIV knowledge, sex- and drug-related behavior, and perceived self-efficacy among polydrug users classified by gender

Variables	Females (n = 1124)	Males (n = 498)	Total (N = 1622)
	Mean (SD)	Mean (SD)	Mean (SD)
Age (y)	31.69 (6.32)	34.98 (7.99)	32.68 (7.02)**
Age at first drug use (y)	20.19 (5.68)	21.49 (7.42)	20.58 (6.29)**
Age at first sexual intercourse (y)	17.00 (2.09)	16.54 (2.56)	16.86 (2.25)**
	n (%)	n (%)	n (%)
At least 9 y of education	508 (48)	173 (37)	681 (45)**
HIV positive	224 (20)	163 (33)	387 (24)**
Knowledge of HIV transmission (correct answers)			
Sharing needles may cause HIV infection	1111 (99)	484 (99)	1595 (99)
Vaginal and anal sex are ways of transmitting HIV	1090 (97)	466 (97)	1556 (97)
Mosquito bites are a way of transmitting HIV	941 (84)	402 (83)	1343 (84)
Condom use is an effective way to prevent HIV during sex	1032 (92)	457 (94)	1489 (92)
An HIV-positive mother cannot breast-feed her child	886 (79)	344 (72)	1230 (77)**
Multiple sexual partners in the prior 6 mo	206 (19)	191 (39)	397 (25)**
Used condom during last sexual encounter	237 (22)	155 (33)	392 (26)**
Syringe sharing during last drug use	135 (15)	78 (19)	213 (16)
Perceived self-efficacy of not sharing needles			
Confident	1057 (95)	428 (88)	1485 (93)**
Not confident	58 (5)	61 (13)	119 (7)
Perceived self-efficacy of condom use			
Confident	924 (83)	288 (59)	1212 (76)**
Not confident	189 (17)	200 (41)	389 (24)

Independent-sample *t* tests and  $\chi^2$  tests were performed to examine gender differences for continuous variables and categorical variables, respectively. Significance levels were adjusted by 15 comparisons using the Bonferroni procedure.

\* $P < .05/15$ .

\*\*  $P < .01/15$ .

gender. Of the 1622 participants, 1124 (69%) were women, and 498 (31%) were men. Twenty-four percent of the respondents were HIV positive. Regarding HIV risks, 392 (26%) had used a condom during their last sexual intercourse, and 213 (16%) shared syringes during their last drug episode. To compare gender differences on selected variables, the Bonferroni correction was used to adjust the significance level for multiple comparisons (viz,  $\alpha \leq .05/15 = .0033$ ). The adjusted *P* values are reported below. Women were younger ( $t = -8.67$ ;  $P < .001$ ), more likely to have completed 9 years of education ( $\chi^2 = 15.62$ ;  $P < .001$ ), and less likely to be HIV positive ( $\chi^2 = 31.40$ ;  $P < .001$ ) than men. Both sexes scored high on knowledge about HIV transmission.

With regard to drug-related behavior, 16% had shared syringes, and 22% had shared rinse water during their last drug experience before detention. Women started using illicit drug at a younger age than men ( $t = 3.76$ ;  $P < .001$ ). There was no significant difference between men and women on syringe sharing at the time of last drug use ( $\chi^2 = 4.19$ ;  $P = .04$ ).

With regard to sexual risk behavior, 25% reported having multiple sexual partners in the 6 months before detention, and 26% reported using a condom during their last sexual encounter. Women were older than men when they first had sexual coitus ( $t = 3.68$ ;  $P < .001$ ), and they were less likely to use a condom during their last sexual encounter ( $\chi^2 = 19.94$ ;  $P < .001$ ). Men were more likely to have multiple sexual partners in the 6 months before the survey ( $\chi^2 = 75.19$ ;  $P < .001$ ).

More female drugs users than male drug users were confident that they would use condoms when having sex while on drugs (83% vs 59%;  $\chi^2 = 106.26$ ;  $P < .001$ ). In addition, women were more confident than men that they would not share syringes when injecting heroin with friends (95% vs 88%;  $\chi^2 = 26.18$ ;  $P < .001$ ).

### 3.2. Logistic regression analysis

As the perceived self-efficacy items were scored dichotomously, logistic regression was performed to examine the associations between perceived self-efficacy and other variables. The variables selected for the logistic regression were those found to be related to the risk of HIV infection in previous research [3-6,9,10]. Besides gender, they included background information (age, education, HIV knowledge, and HIV status), sex-related factors (age of first sexual intercourse, condom use, and sexual partners), and drug-related factors (age at first drug use and needle sharing at last injection). Possible moderation effects were tested by entering interactions between gender and the other predictors in the regression.

Table 2 presents the results for the 2 HIV risk situations in relation to gender, age, education, HIV status, HIV knowledge, sex-related behavior, and drug-related behavior. The results indicate that participants who were women, older, had greater knowledge about HIV, started having sex at a younger age, used a condom in their last sexual encounter, and had multiple sexual partners rated themselves significantly higher than other respondents on perceived self-efficacy regarding condom use (odds ratios, 21.21, 1.12, 1.35, .91, 2.21, and 1.72, respectively). A significant gender-by-age interaction indicates that age differences between the high and low perceived self-efficacy groups on condom use were greater for men (35.87 vs 33.61 years) than for women (31.68 vs 31.5 years old) (odds ratio = .95). The results also show that participants who were women, HIV positive, had greater knowledge about HIV, used a condom during their last sexual encounter, and shared needles during their last drug

Table 2  
Results of the logistic regression analysis predicting polydrug users' perceived self-efficacy regarding condom use and not sharing needles

Predictors	Condom use			Not sharing needles		
	B	SE B	Odds ratio	B	SE B	Odds ratio
Gender (female, 2; male, 1)	3.05	.77	21.21**	1.07	.26	2.92**
Age (y)	.11	.04	1.12**	.01	.02	1.01
Education	.27	.16	1.31	-.40	.25	.67
HIV serostatus	-.04	.19	.96	1.12	.27	3.06**
HIV knowledge	.30	.10	1.35**	.32	.15	1.37*
Age (y) at first sexual intercourse	-.09	.04	.91*	-.08	.05	.93
Condom use at last sexual encounter	.79	.19	2.21**	.80	.32	2.23*
Multiple sexual partners	.54	.17	1.72**	.06	.28	1.06
Age (y) at first drug use	.00	.05	1.00	.04	.03	1.04
Shared needles at last injection	.06	.21	1.06	.81	.26	2.24**
Age (y) by gender	-.05	.02	.95*			
Test		<i>df</i>	<i>P</i>		<i>df</i>	<i>P</i>
Goodness of fit (Hosmer-Lemeshow)	3.37	8	.91	13.33	8	.10
Nagelkerke $R^2$	.17		<.01	.14		<.01

B = estimates of logistic regression; SE B = standard error of estimates. Knowledge-of-HIV-transmission scores were summed across the 5 assessed items. The Hosmer-Lemeshow tests were nonsignificant ( $P > .05$ ) for both models, suggesting that the models fit the data well.

\*  $P < .05$ .

\*\*  $P < .01$ .

encounter reported higher perceived self-efficacy with regard to not sharing needles than other participants (odds ratios, 2.92, 3.06, 1.37, 2.23, and 2.24, respectively).

#### 4. Discussion

The results revealed gender differences in HIV-related risk behavior and perceived self-efficacy in HIV risk situations among polydrug users. Specifically, male users were more likely to be HIV positive, have multiple sexual partners, and share needles at last drug use than female users. Women were less likely than men to use a condom during their last sexual encounter and more likely to feel confident that they would use safer sex practices in risk situations. The findings are consistent with those of previous studies indicating that male IDUs were more likely than female IDUs to share needles or paraphernalia with others and to perceive less self-efficacy regarding these safer practices [8,9].

The results also show that female polydrug users had more confidence than male users that they would use a condom while having sex when also using drugs. This result is also consistent with those of previous studies on gender differences in perceived self-efficacy regarding condom use [8,9]. However, our finding that men were more likely than women to use a condom during their last

sexual encounter demonstrates a gap between confidence and actual behavior. In previous studies, female drug users were found to be more likely than male drug users to report that they did not always use a condom when engaging in casual sex [13]. In addition, women were less likely than men to use condoms with steady sexual partners [12].

A possible explanation of these disparate findings is that Taiwanese culture is patriarchal and conservative, which means that women are restricted in their sexual expression and are reluctant to talk about sexuality. The balance of power and control is in the hands of men in this patriarchal culture [14]. A previous study of female Taiwanese amphetamine users [3] found that they were less likely than comparable male users to use a condom during sexual intercourse because men exert more control in sexual encounters; women may even find that a man becomes violent if they insist on condom use. Thus, further studies should focus on the male role and develop programs for decreasing sex-related risk behavior in men.

The study also found that female polydrug users reported higher perceived self-efficacy regarding not sharing syringes when injecting heroin with friends. This result can partially be explained by the fact that men are more likely than women to share syringes with friends [12]. Thus, HIV intervention programs should focus on men in their efforts to enhance self-efficacy in HIV risk situations and consider gender differences in such situations.

In addition to gender differences, it was found in this study that respondents who were younger, had their first sexual intercourse at a younger age, did not use a condom during their last sexual encounter, and had multiple sexual partners reported lower perceived self-efficacy than other respondents with regard to condom use. The finding that condom use at the last sexual encounter was associated with higher self-efficacy with regard to condom use is consistent with previous studies [10,15]. According to self-efficacy theory [16], the information resources on which perceptions of self-efficacy are based include past accomplishments, vicarious experiences, verbal persuasion, and emotional arousal. The theory posits that prior experiences tend to have a large impact on perceptions of self-efficacy. Thus, the relation between perceptions of high self-efficacy and previous condom use is not surprising because the respondents who had used condoms were the more likely to know where to obtain them, were less shy about obtaining them, were more likely to convince their partner to use them, and knew exactly how to use them during sexual intercourse [15,17]. Our results also revealed a moderation effect of age on the relationship of gender to perceived self-efficacy of condom use. This effect can be explained by noting that it coincides with the patriarchal Taiwanese culture as well as self-efficacy theory in that men are in control of sexual activities and that the older the man, the greater the efficacy of condom use.

The results also show that HIV serostatus, HIV knowledge, condom use at last sexual encounter, and sharing needles at last injection were associated with perceived self-efficacy in not sharing needles. The finding that sharing needles at last injection was associated with higher perceived self-efficacy regarding not sharing needles is interesting because it is originally hypothesized that lower perceived self-efficacy scores were associated with needle sharing behavior. We think that the respondents in this study may have responded to something similar but other than the intended measured situation of sharing needles with friends at their last injection. Previous studies indicate that IDUs in Taiwan are likely to share needles with their sex partners or their own families [3,4,18]. Thus, it is plausible to suggest that our respondents may have tended to overlook the risk of contracting HIV through sharing needles with intimate sex partners. Unfortunately, we did not ask whom they shared needles with at the last injection episode; we assessed risk sharing only with friends, not with intimate partners and/or families. Further research is needed to conclusively determine whether risk perception of HIV infection differs according to who receives the shared needles.

In addition to the significant gender differences, HIV knowledge was found to be associated with perceived self-efficacy among polydrug users with regard to condom use and not sharing needles [18]. Previous studies have yielded mixed results in this regard. For example, a study based on interviews of 15 female drug users found that although the respondents were well educated about the routes of HIV transmission, they did not engage in safer HIV-related behavior [4]. Another study found that although younger women who reported having this knowledge were more likely than older women to report higher self-efficacy with respect to condom use, there was no such knowledge and age interaction with men [15]. The relation between knowledge and practice in drug users needs further research and more validation.

#### 4.1. Limitations of the study

Because perceived self-efficacy with regard to safer behavior was measured by single items addressing specific risk situations, the results of the present study should be interpreted cautiously. Other limitations follow from the fact that the respondents were not a random sample of the predominantly hidden population of polydrug users. One reason why obtaining a random sample from this population is so difficult is that there is no reliable way to identify polydrug users. For example, our sample did not include street polydrug users who had not been arrested by police officers for drug offenses. Further research is needed to determine conclusively whether at-risk men and women who get caught differ systematically from those who do not. Another reason why our respondents cannot be considered a representative sample of polydrug users nationwide is that men declined our

invitation to participate in the study more frequently than women. In contrast to previous studies in which participants received monetary incentives, we provided no reimbursement of any kind. On the other hand, we informed our respondents about the anonymity and confidentiality of data collection, thereby reducing the likelihood of bias toward socially desirable answers.

#### 4.2. Practical implications of the study

The findings from this study have several policy implications. First, we found that 16% of the polydrug users shared a syringe during their last drug encounter and that 37% indicated that they had shared syringes in the 6 months before detention. Only about 11% of the polydrug users had used condoms often in the prior 6 months while having sex with their primary sexual partner, and 26% used a condom during their last sexual encounter. These results suggest that more work needs to be done to promote condom use and safe injection practices among polydrug users. In Taiwan, health education and testing for HIV in prisons provide an important opportunity for HIV prevention among IDUs. Unfortunately, at present, most health care professionals in prisons are not well trained in implementing HIV prevention programs and services. Consequently, increasing prison health care professionals' knowledge about HIV/AIDS as well as their communication, counseling, and testing skills is an essential first step in reducing HIV risk factors [3].

Second, the findings provide evidence for gender differences in both injection behavior and sexual risk behavior in polydrug users in Taiwan. To design effective intervention programs for reducing HIV risk behavior, whether it involves sex or drugs, it is necessary to consider gender differences.

Third, the findings provide evidence that there are gender differences in perceived self-efficacy regarding the adoption of safer sex and drug practices among polydrug users in Taiwan. To design intervention programs that effectively raise polydrug users' perceived self-efficacy, it is necessary to consider gender differences in response to HIV risk situations.

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