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## CLINICAL ARTICLE

## Knowledge, awareness, and attitudes of female sex workers toward HPV infection, cervical cancer, and cervical smears in Thailand

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## ABSTRACT

**Objective:** To determine the knowledge, attitudes, and awareness of female sex workers (FSWs) regarding cervical cancer and its prevention in Thailand. **Method:** From August through November 2008, 402 consecutive FSWs were recruited for interviews. **Results:** The mean knowledge score was 4.9 (maximum possible, 15; range, 0–14). Approximately 60% of the FSWs had knowledge scores less than 5. Low education and a lack of health insurance were significant independent predictors of low knowledge scores (adjusted odds ratios, 3.17 and 1.97, respectively). More than half of the FSWs were unaware of being at higher risk for HPV infection or of the possible consequences of HPV infection. The negative attitude regarding cervical screening was caused by the fear of abnormal results (27.9%), experiencing pain (18.4%), and embarrassment (14.7%). **Conclusion:** The knowledge and awareness of HPV infection, cervical cancer, and utility of cervical smears is low among FSWs in Thailand. Designing and implementing effective interventions is crucial and merits attention in future research.

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## 1. Introduction

Sex workers are at high risk for sexually transmitted disease (STD) [1–3]. In female sex workers (FSWs), risks associated with cervical cancer include early age at first sexual intercourse, multiple sexual partners, and cigarette smoking. Moreover, abnormal cytologic results, human papillomavirus (HPV) infection with high-risk strains, and HPV-related cervical disease are significantly more prevalent among FSWs than in control groups [1,4–7]. Thus, beyond STD prevention, it is important to face the issues regarding cervical cancer prevention.

It is commonly recognized that knowledge and awareness are factors contributing to the success of any prevention program. Women with low levels of knowledge and awareness about cervical cancer and its prevention are less likely to keep their prevention program appointments [8]. Evaluations of awareness, basic knowledge, and attitudes about cervical cancer and prevention are required if an effective program is to be designed. Although these issues have been explored [9–13], studies with FSWs are limited [14]. The present study was conducted to determine the awareness, knowledge, and attitudes of FSWs regarding HPV infection and cervical cancer in Thailand.

## 2. Materials and methods

The Chiang Mai Sexually Transmitted Infection (STI) Centre has launched a surveillance campaign promoting regular STD testing and safe sex practices among FSWs. Both employers and FSWs are directly approached to encourage their participation, and an outpatient gynecology clinic was made available, with facilities for cervical cytologic screening as well as STD testing and treatment.

After approval from the Faculty Ethics Committee, from August 1, 2008, through November 30, 2008, 402 FSWs were approached at the gynecology clinic and asked to participate in a survey. All agreed.

A pilot questionnaire was first administered to a sample of volunteers attending the clinic. It was then revised, presented for ethical approval, and modified accordingly. All responses were anonymous. The authors expecting low education levels and a high proportion of non-Thais among the FSWs, the questionnaire was administered through an interviewer. The services of only 1 female interviewer were used to minimize the possibility of interviewer bias. She was given a detailed orientation on the study protocol and the questionnaire survey. Guides were based on a comprehensive literature review, and aimed at giving the interviewer basic information on cervical carcinogenesis. Before she was hired, the interviewer carried out a practice session under the observation of the investigators and received feedback.

The participants gave informed consent before the interview started. They were interviewed in a private room for an average of 15 to 20 minutes while they were waiting for gynecologic services. After the

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**Table 1**  
Demographics of the 402 study participants.<sup>a</sup>

Variable	Value
Age (mean ± SD), y	27.1 (6.6)
Nationality	
Thai	269 (66.9)
Other	133 (33.1)
Marital status	
Married	59 (14.7)
Separated/divorced/widowed	46 (11.4)
Never married	297 (73.9)
Education	
No formal education	131 (32.6)
Primary education	90 (22.4)
Secondary education or higher	181 (45.0)
Income per month in baht	
<10,000	152 (37.8)
10,000–25,000	195 (48.5)
>25,000	55 (13.7)
Having health insurance	
No	178 (44.3)
Yes	224 (55.7)
Type of commercial sex work	
Brothel-based	339 (84.3)
Freelance	63 (15.7)

<sup>a</sup> Values are given as number (percentage) unless otherwise indicated.

interview, they received detailed counseling about HPV infection, cervical cancer, and cervical smear (or “Pap smear”) screening.

The questionnaire was divided into 4 sections to collect information on the following: (1) demographic and occupational background; (2) knowledge of HPV infection, cervical carcinogenesis, and cervical screening; (3) awareness of the risks of HPV infection, abnormal Pap smear results, and cervical cancer; and (4) attitudes toward Pap smear screening. All items were assessed for validity by health survey experts.

The 15 questions assessing knowledge were “true/false/do not know” questions. For each participant, overall knowledge scores were computed as the sum of correct responses, resulting in scores ranging from 0 to 15.

To evaluate awareness, participants were asked to compare themselves with women in general regarding their risks of HPV infection, abnormal Pap smear results, and cervical cancer. Responses were divided into 4 categories: “more than”, “same as”, “less than”, and “do not know”.

In the attitude section, a 4-point Likert scale with the “strongly agree”, “agree”, “disagree”, and “strongly disagree” categories was used.

The data were analyzed using SPSS computer software (SPSS, Chicago, IL, USA). Logistic regression analysis was used to detect independent factors.  $P < 0.05$  was considered statistically significant.

**Table 2**  
Knowledge about HPV infection, cervical cancer, and Pap smear screening among the 402 sex workers.<sup>a</sup>

Question	Correct answer	Does not know
Cervical cancer is the most common female cancer in Thailand ( <b>true</b> )	343 (85.3)	49 (12.2)
Cervical cancer is caused by HPV infection ( <b>true</b> )	58 (14.4)	334 (83.1)
HPV infection is contracted by sexual contact ( <b>true</b> )	110 (27.4)	287 (71.4)
HPV infection can be prevented by vaginal douching after intercourse ( <b>false</b> )	72 (17.9)	266 (66.2)
HPV infection can be completely prevented by using a condom ( <b>false</b> )	37 (9.2)	228 (56.7)
Smoking increases risk of cervical cancer ( <b>true</b> )	193 (48.0)	120 (29.9)
Having multiple sexual partners increases risk of cervical cancer ( <b>true</b> )	282 (70.1)	73 (18.2)
Sex at an early age increases risk of cervical cancer ( <b>true</b> )	251 (62.4)	89 (22.1)
Using combined contraceptive pills increases the risk of cervical cancer ( <b>true</b> )	118 (29.4)	186 (46.3)
Having STD increases the risk of cervical cancer ( <b>true</b> )	278 (69.2)	100 (24.9)
Cervical cancer is commonly present with vaginal discharge or bleeding even in early stage of disease ( <b>false</b> )	15 (3.7)	110 (27.4)
Pap smear is used to prevent cervical cancer ( <b>true</b> )	136 (33.8)	260 (64.7)
Pap smear is solely indicated in women with vaginal discharge or bleeding ( <b>false</b> )	36 (9.0)	272 (67.7)
An abnormal Pap smear result is indicative of cervical cancer ( <b>false</b> )	42 (10.4)	283 (70.4)
A Pap smear result can be known immediately after vaginal examination ( <b>false</b> )	56 (13.9)	270 (67.2)

Abbreviations: HPV, human papillomavirus; STD, sexually transmitted disease.

<sup>a</sup> Values are given as number (percentage).

### 3. Results

Demographic characteristics are shown in Table 1. Of the 402 FSWs, 161 (40.0%) were nulliparous. The median duration for sex work was 2 years (interquartile range [IQR], 1.4 years). The median number of clients per week was 7 (IQR, 3.10). The mean ± SD age was 18.2 ± 2.3 years at first sexual intercourse, and it was 23.6 ± 5.1 years when the participants became FSWs. Most participants (84.3%) worked in brothels.

A total of 105 FSWs (26.1%) reported smoking; 57 (14.2%) had previously been diagnosed as having an STD; 394 (98.0%) reported consistently using condoms with clients; and 203 (50.5%) reported using or having used combined oral contraceptives (median duration, 3 years [IQR, 1.5 years]).

The 345 FSWs (69.7%) who reported having had a Pap smear taken in the past 5 years cited the following as their 3 main reasons for being screened: their participation in a surveillance program recommended by the employers and staff of the STI Centre (63.8%); their fear of having cervical cancer (12.8%); and their desire to know (5.5%). Sixteen FSWs had abnormal cytologic results, but in all cases the final diagnosis was only intraepithelial lesions.

The 122 FSWs (69.7%) who reported never undergoing Pap smear screening cited as their 3 main reasons an absence of abnormal symptoms (66.7%); not knowing where to be screened (16.4%); and the fear that cervical cancer might be found (8.2%).

Although most FSWs (85.3%) knew that cervical cancer is the most common cancer affecting women Thailand, knowledge about HPV infection, HPV prevention, and Pap smear screening was considerably low. Although 48% to 70% of the FSWs reported that smoking, sex at an early age, multiple sexual partners, and STD increase the risk of cervical cancer, only 29% knew about the association between taking combined contraceptive pills and cervical cancer (Table 2).

Overall, the FSWs answered from 0 to 14 of the 15 questions correctly, but the scores were generally low, for a mean of 4.9 ± 2.4 and a median of 5.0. The knowledge scores of 246 FSWs (61.2%) were especially low (<5). Logistic regression analysis revealed low education (no formal education or primary school) and a lack of health insurance to be independent predictors of very low knowledge scores (adjusted odds ratios [OR], 3.17 [95% confidence interval [CI], 1.99–5.05;  $P < 0.001$ ] and OR, 1.97 [95% CI, 1.22–3.19, respectively;  $P = 0.006$ ]).

Risk awareness of HPV infection, abnormal Pap smear results, and cervical cancer among the 402 FSWs are shown in Table 3. Overall, more than half of the FSWs in this study were unaware of their increased chances of having HPV infection and of the possible consequences of such infection.

In this study, attitudes towards Pap screening were generally positive (Table 4). The most common negative attitudes regarding Pap

**Table 3**

The 402 sex workers compared their perceived risk of HPV infection, abnormal Pap smear, and cervical cancer with the risk they perceived for the general female population.<sup>a</sup>

Risk of	More than	Same as	Less than	Do not know
HPV infection	158 (39.3)	54 (13.4)	12 (3.0)	178 (44.3)
Abnormal Pap smear	112 (27.9)	67 (16.7)	13 (3.2)	210 (52.2)
Cervical cancer	183 (45.5)	68 (16.9)	12 (3.0)	139 (34.6)

Abbreviation: HPV, human papillomavirus.

<sup>a</sup> Values are given as number (percentage).

screening were fear that abnormal results would be found (27.9%), the pain of the procedure (18.4%), and embarrassment (14.7%). Those who answered the 5 questions with a positive attitude were more likely to have had a Pap smear taken within the past 5 years than those who answered 1 or more questions with a negative attitude (73.2% and 64.4%, respectively;  $P=0.06$ ) (Table 4). There was no significant difference in mean knowledge scores between FSWs with positive attitudes and those with negative attitudes, however (4.90 vs 4.88; mean difference, 0.019; 95% CI,  $-0.47$  to  $0.51$ ).

The main sources of information regarding cervical cancer were healthcare providers (54.7%); friends (10.9%); print and electronic media (5.5%); and multiple information sources (26.4%).

#### 4. Discussion

In this study, the authors evaluated knowledge, attitudes, and awareness toward HPV infection, cervical cancer, and Pap smear screening among FSWs in Thailand. To improve cancer control, it is imperative to understand what these women at high risk know and think about cervical cancer. Although most (85.3%) of the FSWs in this study correctly answered that cervical cancer is the most common cancer affecting women in Thailand, they demonstrated very little knowledge about HPV infection and Pap smear screening. Only approximately 14% of the FSWs knew that HPV is the causal factor for cervical carcinogenesis, and only 27% knew that HPV infection is contracted by sexual contact. These findings emphasize the need to improve FSWs' understanding of the link between HPV, Pap smear result, and cervical cancer.

One important question about cervical cancer education is how to identify the patients with the least knowledge. In this study, formal education was a significant independent predictor for knowledge score. The FSWs with little or no formal education were 3 times more likely to have a very low knowledge score. It may be that women with low education levels are less equipped to understand and benefit from routine health education. Special education techniques to communicate essential information to FSWs with low literacy skills need to be developed.

In this study, a lack of health insurance was also found to be an independent predictor of poor knowledge. The FSWs without health

insurance were twice as likely to have a very low knowledge score than those with health insurance. Because the information provided to patients receiving health care can improve their knowledge [10], the FSWs without health insurance, and therefore little or no access to any healthcare service, were at a higher risk of having poor knowledge.

Attention must be drawn to the fact that the most common reason, cited by 67% of the FSWs, for not undergoing Pap smear screening was an absence of symptoms. This might be explained by their lacking knowledge of the natural history of cervical cancer, and stresses the necessity of including information about the natural course of cervical cancer in an information program.

It is important to note that only some of the risk factors for cervical cancer were recognized by more than half of the FSWs, a group in which the highest prevalence of risk factors is found, and that most of the factors they recognized—such as multiple partners, sexual intercourse at an early age, and STD—were related to sexual exchange. Others risks, such as smoking and long-term use of combined oral contraceptives, were recognized by fewer than half of the FSWs. The partial picture that the FSWs had of risk factors for cervical cancer in this study is similar to that depicted in other reports [12,15].

Interestingly, we were able to demonstrate a correlation between attitudes and previous practice regarding Pap smear screening. The FSWs with a negative attitude were less likely to have ever had a cervical smear taken than those with a positive attitude. Although the level of knowledge seems likely to be associated with attitude and practice, we, like others [16,17], were unable to confirm this association. This might suggest that, for any coordinated program to be successful, attitudinal barriers to cervical cancer prevention need to be addressed regardless of knowledge status.

Surprisingly, two-thirds of the FSWs in this study had had at least 1 Pap smear taken. On the other hand, 63.8% of these FSWs owed their screening to the surveillance program. As less than 20% underwent Pap screening on their own initiative, another issue is whether this high screening rate will be maintained over time, particularly among FSWs who change occupation. Those changing occupation are no longer covered by this specific surveillance program, but still are at risk for complicated HPV diseases, which evolve in the long term.

A high level of disease awareness is the key indicator of the success of any program [18,19]. For example, in a study, persons who knew they were HIV-positive reported a 70% reduction in unprotected sexual intercourse compared with those who were unaware of being HIV seropositive [19]. Given the notably low level of awareness of being at a higher risk for HPV infection than the general female population in the present study, and the adverse consequences of HPV infection, implementing effective interventions for promoting this awareness is crucial and therefore merits attention in future research.

Although there is hope that HPV vaccination will reduce the incidence of cervical cancer, there are several limitations to implementing vaccination for FSWs. First, the cost of the vaccine is presently too high to be covered by a government support program, and few of these socioeconomically disadvantaged women would be able to afford the cost of her own vaccination. Second, the vaccination benefits are unclear for women previously exposed to HPV [20], and thus the role of HPV vaccination for FSWs, who carry a high risk of having been exposed, is questionable. Additionally, the cervical screening program will be continued for vaccinated women until more experience with the vaccine is available [20]. Therefore, developing effective information campaigns for groups at high risk, such as the FSWs in this study, is relevant.

Most of the study participants were brothel based and attended a gynecology clinic under a sexual health surveillance program for FSWs. It is possible that the experience of participating in this program will improve the baseline knowledge of FSWs, but currently a substantial knowledge deficit persists despite the sexual health surveillance program. Health care providers cannot easily reach FSWs working on their own, and these women may have even more limited knowledge.

**Table 4**

Attitudes toward cervical cancer screening among the 402 sex workers.

Variable	Participants' answer on the Likert scale, No. (%) <sup>a</sup>	
	Agree <sup>b</sup>	Disagree <sup>c</sup>
I would be embarrassed having a Pap smear taken	59 (14.7)	343 (85.3)
Having a Pap smear taken would be painful	74 (18.4)	328 (81.6)
Having a Pap smear taken would be difficult and complex	45 (11.2)	357 (88.8)
I am afraid a Pap smear would reveal cervical cancer	112 (27.9)	290 (72.1)
It is difficult to take the time to have a Pap smear taken	18 (4.5)	384 (95.5)

<sup>a</sup> The 4-point scale eliciting the answers "strongly agree", "agree", "disagree", and "strongly disagree" was dichotomized to "agree" vs "disagree".

<sup>b</sup> Negative attitude.

<sup>c</sup> Positive attitude.

In conclusion, knowledge and awareness of HPV infection and its serious consequences are low among FSWs, a group of women at a much increased risk of becoming infected with HPV, having abnormal Pap smear results, and developing HPV-related cervical disease. A low education level and a lack of health insurance are the independent factors associated with very poor knowledge. These findings solidly support the rapid development and implementation of intensive information programs for FSWs in Thailand.

### 5. Conflict of interest

The authors report no conflicts of interest.

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