

RESEARCH ARTICLE

Knowledge and Attitudes of Bangkok Metropolitan Women towards HPV and Self-Sampled HPV Testing

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Abstract

Background: To evaluate knowledge of Bangkok women regarding HPV and self-sampled HPV testing, and their attitudes towards testing. **Materials and Methods:** Thai women who had lived in Bangkok for more than 5 years, aged 25-to-65 years old, were invited to join the study. Participating women were asked to a complete self-questionnaire (Thai language), with literate assistance as needed. The questionnaire was divided into 3 parts: (I) demographic data, (II) knowledge and (III) attitudes towards self-sampled HPV testing. Before proceeding to Part III of the questionnaire, a 15-minute educational video of self-sampled HPV testing was presented to all participants. **Results:** Among 2,810 women who answered the questionnaires, 33.7% reported that they did not know about HPV. The characteristic features of these women were older age (> 50 years), lower income (< 600 USD/month), unemployed status, and non-attendees at cervical cancer screening. Only small numbers of women (4.6%) responded that they had heard about self-sampled HPV testing. After having information, 59.6% would not use the self-sampled HPV testing as a method of cervical cancer screening (non-acceptance). Factors significantly associated with the non-acceptance were older age, lower income, having no knowledge about HPV or self-collected HPV testing, a perception that the testing was unreliable and a concern that they might not be able to perform it correctly. **Conclusions:** Nearly half and almost all Bangkok women did not know about HPV and self-sampled HPV testing, respectively. Approximately 60% of Bangkok women refused to do the self-sampled HPV testing. Significant negative attitudes were concerns that the testing would be unreliable and a lack of confidence to perform the procedure correctly. Education about HPV and self-sampled HPV testing, ease of the procedure, or the testing models may increase rate of acceptability or positive attitudes.

Keywords: HPV - self-sampled HPV testing - attitude - barriers - unreliability

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Introduction

Cervical cancer is the fourth most common cancer in women worldwide. Majority of cervical cancer incidence (84% or 445,000 cases) and deaths (86% or 230,000 cases) occurred in developing countries (Torre et al., 2015). In Thailand, cervical cancer is the second most common gynecologic cancer. A successful reduction of cancer incidence and mortality lies on effective cancer screening to detect pre-invasive cervical lesions or early stage cancer. Several methods which are commonly used for cervical cancer screening include cervical cytology testing, visual inspection after acetic acid (VIA), co-testing of cytology and human papilloma virus (HPV) testing (WHO guidelines, 2014), and most recently, primary HPV screening (Huh et al., 2014).

One key factor to a success of effective screening is a high coverage of target population (WHO guidelines,

2014). Contradictory to the incidence, there is still a discrepancy of coverage rates between developed and developing countries: 94% in developed countries and only 45% in developing countries (Gakidou et al., 2008).

In Thailand wherein the conventional cytological Pap testing is covered by the national health system, the coverage rate was only 28% (Khuhaprema et al., 2014). Previous studies in Thailand explored the reasons for inadequate screening or non-attendance (Kritpetcharat et al., 2003; Thanappapasr et al., 2012; Budkaew and Chumworathayi, 2014; Wongwatcharanukul et al., 2014). Among several reasons reported, the 3 most common were a perception that they had no risks, misconception about screening, and shyness. One study from our group, which evaluated knowledge, attitudes and behavior of Bangkok Metropolitan women towards cervical cancer screening, found 3 major reasons among women with inadequate screening: lack of symptoms, fear of pain, and

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embarrassment (Chaowawanit et al., 2016).

Several strategies have been used in an attempt to increase the coverage cervical cancer screening e.g. a campaign in special events, direct personal invitation to target women via phone, text messaging, postal mail, or their combinations. These methods improved the coverage only to a certain limit (Chumworathayi et al., 2007; Lee et al., 2014; Everett et al., 2011). To overcome the inconvenience the women might have, a self-collected specimen for cytology was introduced. However, self-collected cervical cytology was not commonly practiced due to its poor performance compared to the medical practitioner-collected specimen (Budge et al., 2005; Othman and Mohamad, 2014). With the increasingly common use of HPV testing, the self-sampling HPV was introduced and tested in many studies from Western and few Asian countries e.g. USA, Finland, Australia, Switzerland, Taiwan, etc. (Chen et al., 2014; Virtanen et al. 2015; Fagnoli et al., 2015; Sultana et al., 2015). Nevertheless, data from some other countries may not hold true in the others where differences in cultural background, education, economics or acceptance of the women may exist. Our study aimed to assess the knowledge about HPV and self-collected HPV testing and attitudes towards the testing of Bangkok women.

Materials and Methods

The protocol was approved by the Human Research Ethics Committee of the institution. We enrolled 3,000 women from the main study base on calculation of total response in the self-sampling group for screening from previous study (Oranratanaphan et al., 2014).

Before the study conduct, questionnaire in Thai language to evaluate knowledge and attitude of self-collected HPV cervical cancer screening of women were contemplated, discussed, tried out in 30 women who sought for medical care in the institution, adjusted and discussed again until consensus. The final questionnaire was validated by 3 experts (not involved in the study) in the Obstetrics and Gynecology Department of the institution. The study was conducted from mid of September until the end of December 2014. Thai women aged 25-to-65-year-old and had lived in Bangkok for 5 years or over were invited into the study. Exclusion criteria were women who: had had hysterectomy for any reasons, or being pregnant. Women who did not provide any information particularly of HPV and self-collected HPV testing were also excluded.

This study was a parallel project to another study to evaluate knowledge, attitudes and behavior of Bangkok Metropolitan women towards cervical cancer screening (Chaowawanit et al., 2016). Information about the project was given to all participants who met inclusion criteria by information sheet and verbal explanation in suspicious issues. All women gave written informed consent before completed a questionnaire by themselves with literate assistance if required. Any questions about the questionnaire would be clarified by the research assistant before proceeding.

The questionnaire was divided into 3 parts: (I)

demographic data, (II) knowledge of HPV and self-collected HPV testing, and (III) acceptance and attitudes towards self-collected HPV testing.

Part I of demographic data included: age, marital status, occupation, education level, monthly family income, parity, history of sexual activity and of cervical cancer screening.

Part II composed of 2 questions about their knowledge about HPV and self-collected HPV testing. The women were then classified as having knowledge about HPV or not. The women who were classified as 'having knowledge of HPV' were then queried whether they had ever known about self-collected HPV testing. The women who had no knowledge about HPV and self-collected HPV testing were grouped together as 'having no knowledge of self-collected HPV testing'.

Before proceeding to Part III of the questionnaire, all participants were informed about self-collected HPV testing by watching a 15-minute educational video prepared by the researchers. The outlines of presentation including introduction about HPV as the cause of cervical cancer, brief orientation about external genital organs, self-collected HPV testing devices, how to use, and data of diagnostic performance of the testing.

Part III comprised of questions involving (1)

Table 1. Characteristics of Women Who Participated in the Study (N=2810)

Characteristics	Number	Percent
Age group (years)		
25-30	185	6.6
31-40	577	20.5
41-50	932	33.2
51-60	890	31.7
61-65	226	8
Education level		
No education	41	1.5
Primary school	361	12.8
high school/ diploma	819	29.1
Bachelor degree and above	1589	56.6
Religion		
Buddhism	2695	95.9
Others	115	4.1
Occupation		
Unemployed/ housewife	770	27.4
Employee	1026	42.9
Business/ government officer	864	29.7
Monthly family income (USD) ¹		
< 600	1199	42.7
> 600	1611	57.3
Marital status		
Single	634	22.6
Married/ divorced	2176	77.4
Parity		
Nulliparous	916	32.6
parous	1894	67.4
Sexual intercourse		
Never	282	10
Ever	2528	90
History of cervical cancer screening		
Non-attendees ²	1043	37.1
Attendees	1767	62.9

¹ USD approximated to 36 Baht; ² Never screen or last cervical cancer screening was longer than 5 year

Table 2. Knowledge of HPV and Self-Sampled HPV testing (N=2810)

Characteristics	Knowledge about HPV		P value	Knowledge about self-HPV testing		P value
	No (n=948)	Yes (n=1862)		No (n=2680)	Yes (n=130)	
	n (%)	n (%)		n (%)	n (%)	
Age (years)						
< 50	537 (19.1)	1157 (41.2)	0.005	1596 (56.8)	98 (3.5)	< 0.001
> 50	411 (14.6)	705 (25.1)		1084 (38.6)	32 (1.1)	
Education level ¹						
Lower education	656 (23.3)	1335 (47.5)	0.168	1892 (67.3)	99 (3.5)	0.173
Higher education	292 (10.4)	527 (18.8)		788 (28.0)	31 (1.1)	
Monthly family income ²						
Lower income	475 (16.9)	724 (25.8)	<0.001	1150 (40.9)	49 (1.7)	0.24
Higher income	473 (16.8)	1138 (40.5)		1530 (54.4)	81 (2.9)	
Occupation						
Unemployed	282 (10.0)	488 (17.4)	0.047	742 (26.4)	28 (1.0)	0.125
Employed	666 (23.7)	1374 (48.9)		1938 (69)	102 (3.6)	
Marital status						
Single	216 (7.7)	418 (14.9)	0.84	612 (21.8)	22 (0.8)	0.115
Married/ divorced	732 (26.0)	1444 (51.4)		2068 (73.6)	108 (3.8)	
Parity						
Nulliparous	311 (11.1)	605 (21.5)	0.867	873 (31.1)	43 (1.5)	0.905
Multiparous	637 (22.7)	1257 (44.7)		1807 (64.3)	87 (3.1)	
Sexual intercourse						
Never	106 (3.8)	176 (6.3)	0.149	273 (9.7)	9 (0.3)	0.227
Ever	542 (30.0)	1686 (60.0)		2407 (85.7)	121 (4.3)	
History of cervical cancer screening						
Non-attendees ³	395 (14.1)	648 (23.1)	< 0.001	1001 (35.6)	42 (1.5)	0.245
Attendees	553 (19.7)	1214 (43.2)		1679 (59.8)	88 (3.1)	

¹Education level: higher education = education beyond high school, lower education = education below high school; ²Monthly family income: higher income = family income > 600 USD/month, lower income = family income < 600 USD/month; ³Never screen or last cervical cancer screening was longer than 5 year

acceptance of self-collected HPV testing and (2) attitudes toward HPV testing including concerning of the steps of procedure (ease, confidence, and safety issues), reliability, convenience, cost, issues of referral for further medical care and additional health care services by physicians. The participants could select multiple answers.

Data were analyzed using SPSS statistical software, version 22.0 (IBM Corporation, Armonk, NY, USA). Descriptive statistics were used for demographic data which were summarized as numbers with percentage or mean with standard deviation. For statistical comparisons, characteristic features of women were categorized into 2 groups: age group (> 50 years vs. ≤ 50 years), education level (below high school vs. high school or higher), occupation (unemployed vs. employed), monthly family income (> 600 USD vs. ≤ 600 USD), marital status (single vs. married), parity (nulliparous vs. parous), history of sexual intercourse (never vs. ever had), and history of cervical cancer screening (attendees vs. non-attendees). Attendees were defined when women had history of cervical cancer screening at least once within the past 5 years. Characteristic features of women associated with knowledge of HPV, acceptance and attitudes towards self-collected HPV testing were compared using Pearson Chi-square. The risks of the non-acceptance for the self-collected HPV testing were analyzed by multivariable analyses.

Results

Out of 3,000 women who primarily consented to participate in this study, 190 filled out only part I of the

questionnaires but did not provide any information about their knowledge or attitude towards self-collected HPV testing. Hence 2,810 women were included in the study. Mean age was 46.9 ± 9.9 years old. Characteristics of women are shown in Table 1. Approximately 65% aged 40-60 years. Slightly more than half had education of bachelor degree or higher, or had family income slightly above the national minimum wage (600 USD). Majority (90%) reported history of sexual intercourse. We found that approximately 37% of women in this study were non-attendees regarding their history cervical cancer screening.

Among 2,810 women who answered the questionnaires, 1862 (66.3%) reported that they knew HPV as a cause of cervical cancer. However, only 130 women (4.6% of all women or 6.9% of only those who knew about HPV) had heard about self-collected HPV testing. We studied the characteristic features of women in each group by their knowledge of HPV and self-collected HPV testing (Table 2). Age ≤ 50 years, familial monthly income > 600 USD, employed status, and history of cervical cancer screening (attendees) were significantly associated with having knowledge of HPV. Only age ≤ 50 years was significantly associated with knowledge of self-collected HPV testing (p<0.001).

After all women had 15-minute information about HPV and self-collected HPV testing, they were queried whether they would perform the self-collected HPV testing if provided without any cost. Less than half or 1,133 (40.3%) accepted the testing, 686 (24.4%) refused, and 991 (35.3%) were uncertain. When the women proceeded to part III of the questionnaire involving the attitudes, we found the three most common negative attitudes the

Table 3. Attitudes of Women toward Self-Sampled HPV Testing (N = 2810)

Attitudes towards self-HPV testing*	Number	Percent
Errors and complications of the procedure	1902	67.7
Unreliability	2088	74.3
Inconvenience	698	24.8
Expensive cost	326	11.6
Problems in referral for further medical care	350	12.5
Lack of additional health care services by physicians	923	32.8

* One woman may choose multiple answers

Table 4. Acceptance of Self-Sampled HPV Testing According to Characteristic Features and Attitudes

Characteristic features and attitudes	Acceptance of self-sampled HPV testing		P value
	Accepted	Refused	
	(n,%) (N = 1113)	(n,%) (N = 686)	
Personal factors level 1			
Age > 50	321 (17.6)	410 (22.5)	< 0.001
Lower education	201 (11.1)	340 (18.7)	0.749
Lower family Income	351 (19.3)	471 (25.9)	< 0.001
No occupation	211 (11.6)	280 (15.4)	0.005
Non attendees	246 (13.5)	431 (23.7)	0.351
Knowledge level 1			
No knowledge of HPV	273 (15.0)	346 (19.0)	< 0.001
No knowledge of self-HPV testing	660 (36.3)	1060 (58.3)	0.016
Attitudes towards self-collected HPV testing⁶ level 1			
Errors and complications of the procedure	479 (26.3)	709 (26.3)	0.002
Unreliability	553 (29.3)	780 (42.9)	< 0.001
Inconvenience	178 (9.8)	273 (15.0)	0.376
Expensive cost	157 (8.6)	57 (3.1)	< 0.001
Problems in referral for further medical care	83 (4.6)	140 (7.7)	0.871
Lack of additional health care services by physicians	223 (12.3)	364 (20.0)	0.867

women thought about the self-collected HPV testing were: the reliability of the testing (74.3%), the correct process of collection with a fear of trauma to her own genital tract (67.7%), and the lack of additional health care services by physicians in case of abnormal result (32.8%). Others are shown in Table 3.

We determined factors among all women which might determine the non-acceptance of self-collected HPV testing. Regarding the characteristic features, factors which were significantly associated with the non-acceptance were: age > 50 years old, lower income (monthly income < 600 USD), unemployed status, no knowledge of HPV, and of self-collected HPV testing. For the attitudes of women, the reasons which were more frequently found among the refusal compared to the acceptance were: a perception that the testing was unreliable and a concern that they might not be able to perform it correctly resulting in complications to genital organs. Contradictory finding, more number of women who accepted the testing concerned about the cost than the women who refused. Other reasons were not significantly different between the two groups (Table 4).

We then determined the risks which influenced the acceptance of self-collected HPV testing. The unadjusted and adjusted odds ratios are shown in Table 5. Only age > 50 years old, lower income, no knowledge of HPV, and of self-collected HPV testing were independent risk factors for the non-acceptance of self-collected HPV testing.

Discussion

Despite the availability of many effective cervical cancer screening methods, the coverage rate of screening is still less than optimal in many countries including Thailand (Khuhaprema et al., 2014). The obstacles to cancer screening may be multifactorial, can be from the health care providers or the women themselves. The health organizations in each country have policy to improve how health care can be widely provided to cover all target women in an accessible manner. Various methods have also been used, however, with unsatisfactory results (Chumworathayi et al., 2008; Szarewski et al., 2011).

Regarding the women themselves, the problems of

Table 5. Risks of Non-Acceptance of Self-Sampled HPV Testing in All Women (N=2810)

Personal factors	OR (95%CI)	P value	OR (95%CI)	P value
Age > 50	1.47 (1.23-1.74)	< 0.001	1.38 (1.14-1.66)	0.001
Education below high school	1.01 (0.83-1.22)	0.919	-	-
Family income < 600 USD/month	1.57 (1.32-1.87)	< 0.001	1.60 (1.34-1.91)	< 0.001
No occupation	1.24 (1.03-1.50)	0.023	1.06 (0.87-1.30)	0.531
Non attendees to cervical cancer screening	1.01 (0.97-1.11)	0.433	-	-
Knowledge				
No knowledge of HPV	1.41 (0.18-1.69)	< 0.001	1.34 (1.12-1.62)	0.002
No knowledge of self-HPV testing	2.06 (1.24-3.24)	0.004	1.73 (1.03-2.89)	0.027
Attitudes towards self-collected HPV testing				
Errors and complications of the procedure	1.14 (0.94-1.37)	0.169	-	-
Unreliability	1.27 (1.04-1.56)	0.019	1.39 (1.13-1.72)	0.001
Inconvenience	1.08 (0.88-1.31)	0.44	-	-
Expensive cost	0.62 (0.46-0.84)	0.002	0.55 (0.40-0.75)	< 0.001
Problems in referral for further medical care	1.00 (0.94-1.07)	0.745	-	-
Lack of additional health care services by physicians	1.00 (0.96-1.05)	0.828	-	-

Thai non-attendance to cervical cancer screening had been explored in few studies (Sriplung et al., 2014; Thanaprasit et al. 2012). The most common reason identified among Thai women not having cervical cancer screening in their studies was shyness or embarrassment. Our previous study which focused only to Bangkok Metropolitan women evaluating their knowledge, attitudes and behavior of towards cervical cancer screening demonstrated 3 major reasons among women with non-attendance (inadequate screening): lack of symptoms (54%), fear of pain (33%), and embarrassment or shyness (35%) (Chaowawanit et al., 2016).

The self-collected specimen for cervical cancer screening should be ideal in Thailand and other regions where culture or perception of shyness is the main issue. Some attempted to employ self-collected cytological sampling in the past decade (Bernstein et al., 1985; Pengsaa et al., 2003; Bidus et al., 2005; Budge et al., 2005). However, it was not widely used in clinical practice especially when it had lower sensitivity than the Pap testing performed by healthcare providers. With the evolution of HPV testing, the self-collected for HPV testing was introduced and was found to have high diagnostic performance. The sensitivity to detect lesions \geq CIN2 or \geq CIN 3 were approximately 70-80% and 80-90% (Arbyn et al., 2014). Theoretically, this self-collected HPV testing should be ideal to overcome the problems of women's shyness or inconvenience seeking medical service from health personnel, and should increase coverage rates of cervical cancer screening. Nevertheless, the achievement of this new self-collected HPV testing would certainly lie on the acceptability of women.

Our study evaluated the knowledge of HPV, self-collected HPV testing, and the attitudes towards the testing among nearly 3,000 women of Bangkok which is the capital of Kingdom of Thailand. Slightly less than half of Bangkok women in our study had heard about HPV as the cause of cervical cancer. Factors which were associated with 'having no knowledge' about HPV, were: age > 50 years, lower income, unemployed status, and non-attendees for cervical cancer screening. These data should be focused especially correctable factors, such as, education or campaign on this specific topic. The improvement of recognition should subsequently result to an attachment to cervical cancer screening program. Unfortunately, very small number of the women participated in this study had ever heard about self-collected HPV testing, thus the associated factors to knowledge of self-collected HPV testing could not be defined.

After we briefly introduced the self-collected HPV testing, only 40% of them had positive attitudes or expressed their acceptance. The causes of negative attitudes or non-acceptance towards the testing were: older age, lack of confidence to perform the self-testing correctly, fear of trauma/ infection from the procedure, feeling that the test was unreliable, and having no knowledge of HPV and self-collected HPV testing. Surprisingly, high cost of self-collected HPV testing was the positive factor for acceptance which was independent to level of education, income or employment status (Table 4).

Numbers of studies from various countries, German (Castell et al., 2014), Mexico (Penaranda et al., 2015), African-American (Scarinci et al., 2013), USA (Quincy et al., 2012), and Thailand (Oranratanaphan et al., 2014), evaluated the acceptability of women for self-collected HPV testing or compared it with the conventional screening by healthcare providers.

Studies from other countries showed high acceptability and cost-effectiveness of the self-collected HPV testing among non-attendees women. One previous study among 100 Thai women who reported 85% acceptance rate of women for the self-collected HPV testing (Oranratanaphan et al., 2014). After a trial procedure in the hospital outpatient clinic, the women reported in favor of self-collected HPV testing for the ease of use, less embarrassment, less pain, and being more comfortable. Their acceptance rate was 2 folds higher compared to only 40% acceptance rate in our study. The reasons of this discordant might be from several reasons. First, median age of the women enrolled in their study was younger, 40 years old compared to 47 years in our study. To be emphasized, age > 50 years was the only significant factor associated with the non-acceptance in our study. We postulated that the younger generation are generally more up to date with news and media, and tended to be more open up to any evolution. Second, the history of cervical cancer screening in their study was also higher, 80% compared to 63% in our study. Their high rate of screening history, which was higher than the national report, reflected the concern and familiarity with cervical cancer screening and vaginal examination. Third, the women in their study readily sought for health care services of cervical cancer screening at the hospital. These intended-to- checkup women should have more conscience of health or better attitude than the non-attendees or general population who we solicited to participate in our study. Nevertheless, nearly 40% of women in their study were not confident about reliability of the testing. This reliability issue was also encountered as the most common negative attitude found in 73% of participating women.

The low acceptance rate of women to self-collected HPV testing among women having no knowledge about HPV and to self-collected HPV testing in our study was also demonstrated in a cross-sectional study in Taiwan (Chen et al., 2014). Their study found that women with better knowledge (high scores) assessed by the HPV testing sheet had higher acceptance rate than those low knowledge.

Other studies had proposed several means to enhance the acceptability of self-collected HPV testing (Chen et al., 2014, Penaranda et al., 2015). One of them was an education about HPV and information about the screening performance of HPV testing especially to the non-attendees. Although our team had educated the women participating to the study about basic information and clinical benefit of the testing, the 15-minute duration might not allow women to have comprehensive knowledge about the relationship of HPV and cervical cancer, and self-collected HPV testing. Although 86% of our women had education higher than high school, the particular knowledge of HPV, cervical cancer, and self-collected

HPV testing are unlikely to be covered in a conventional education program in our country. Specific knowledge on this matter should be provided or advertised via media.

The two significant concerns associated with the non-acceptance of women were the possibility of errors and complications the procedure may incur, and the unreliability of the testing. These features were different from the study in Taiwan which found that a perception that they had no risk for cervical cancer, and when the cost of self-sampling was not covered by health insurance were found associated with the non-acceptance of self-collected HPV testing (Chen et al., 2014). This emphasized more on the distinct background in each region even in the same continent of Asia. Our study, after adjusted for other factors, found that a concern of reliability of the testing was a significant risk of non-acceptance. The simple instruction in detail, ease of the procedure, or even the testing models may reassure the women to be more confident. The physicians or health care providers should give information about lower genital tract anatomy, the track of the passing instrument with cartoon or animation might help women, especially those non-attendees, for an understanding to reassure them (Sultana et al., 2015, Penaranda et al., 2015). Special attention should be directed to non-attendees to cervical cancer screening which is the population that cause low coverage rate of cervical cancer screening in Thailand.

Based on the Thai culture, shyness was the most important obstacle to do cervical cancer screening. This factor was reported in previous reports studied on attitudes towards a conventional cervical cancer screening by health practitioners (Thanappapas et al., 2012) and also in our study with the self-collected HPV testing (Chaowawanit et al., 2016). Other ongoing study such as urine HPV testing, vulva HPV sampling and menstrual blood HR-HPV sampling which are easier to collect might be alternative options in the future assuming that their sensitivity are satisfactory (Sahasrabuddhe et al., 2014; Lee et al., 2015). Moreover, the cost effectiveness of this intervention has yet to be proven.

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