RESEARCH ARTICLE

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Acceptability and Preference for Human Papillomavirus Self-Sampling among Thai Women attending National Cancer Institute

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Abstract

Background: Cervical cancer screening is an important public health strategy to reduce cervical cancer incidence and mortality. Human papillomavirus (HPV) self-sampling is the alternative method that can potentially increase participation in cervical cancer screening. This study aimed to evaluate the acceptability of HPV self-sampling as a primary cervical cancer screening among Thai women. **Methods:** A cross-sectional study was conducted at National Cancer Institute, Thailand, between March and September 2021. Eligible women were invited to collect their own samples with a vaginal cotton swab for cervical screening. The data on demographics, acceptability, and preference for HPV self-sampling were collected via a self-administered questionnaire. A Likert scale was used to assess the response of self-sampling acceptability. The multivariable logistic regression determined factors that influence preference for HPV self-sampling. **Results:** A total of 265 participants were recruited. Over 70% agreed that self-sampling was easy, less embarrassing, and not painful. They also felt confident in their ability to self-sample correctly and would recommend this method to a friend or relative. For their next screening round, 66.4% preferred self-sampling whereas 33.6% preferred clinician-collected samples as routine screening. The factors that influence preference for self-sampling were age, marital status, feeling less embarrassed, and confidence in performing the tests. **Conclusions:** Most of the study participants accepted HPV self-sampling. This suggests that the self-sampling method will be an additional option to increase cervical cancer screening coverage which leads to improving the effectiveness of the national program.

Keywords: HPV Self-Sampling- Cervical cancer screening- Acceptability- National Cancer Institute-Thailand

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Introduction

The national cervical screening program was introduced in Thailand in 2005 to reduce the incidence of invasive cancer of the cervix. A Pap smear was used as the primary screening test for cervical cancer, which has now been replaced by human papillomavirus (HPV) testing since 2020. Although an organized screening program has been implemented for over 15 years, cervical cancer continues to be a major public health problem affecting Thai women and still ranks as the fifth most common cancer in Thailand with an age-standardized rate (ASR) of 11.1 per 100,000 (Rojanamatin et al., 2021).

Several studies have shown that the successful implementation of cervical cancer screening depends on being able to achieve high screening coverage for women in the at-risk age group (Aoki et al., 2020; Bruni et al., 2022). According to a survey in 2009, 59.7% of Thai women had ever undergone a cervical cancer screening examination within the past 5 years (Mukem et al., 2015). There are many issues and challenges associated with cervical cancer screening in Thailand. The most common barriers were lack of knowledge and awareness of cervical cancer screening, fear of pain and discomfort during the examination, and embarrassment of exposing their body (Rossi et al., 2011; Chorley et al., 2017; Simo et al., 2021). Whereas George (2021) pointed out that socioeconomic and sociocultural barriers were key factors preventing women from participating in cervical cancer screening. These suggest a need to provide convenient and comfortable ways in which they can easily access screening services.

Self-sampling for HPV (human papillomavirus) is one of the alternative techniques to overcome barriers

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related to cervical cancer screening (Haile et al., 2020; Serrano et al., 2022). Various studies have shown high concordance between HPV screening results from self- and physician-sampling specimens (Petignat et al., 2007; Onuma et al., 2020). Moreover, self-sampling was reported to be highly acceptable among women, and that would increase participation uptake in cervical screening programs (Yeh et al., 2019).

The present study aimed to evaluate the acceptability of HPV self-sampling as a primary cervical cancer screening among Thai women. We also examined attitudes and demographic variables affecting the preferences for HPV self-sampling. These findings will provide basic information to overcome the multiple barriers and enhance the coverage of cervical cancer screening in Thailand.

Materials and Methods

Study population

This cross-sectional study was conducted at National Cancer Institute, Bangkok, Thailand from March to September 2021. Participant eligibility criteria were as follows: (1) women aged 30–60 years who enrolled in cervical cancer screening clinic and gynecology clinic; (2) undergoing both self-sampling and clinician-based sampling; and (3) understanding the research background and willing to provide informed consent. The exclusion criteria were not meet eligibility criteria, pregnancy, or previous hysterectomy. Ethical approval for this study was obtained from the Ethics Committee of the National Cancer Institute (reference EC COA 026/2020).

Before starting the study process, participants were provided all information about the study's purpose. They were assured that their information would be kept private and confidential. After signing a written informed consent, participants were included in the study.

Study design

Participants were invited to perform HPV self-sampling using a vaginal cotton swab. The research staff explained step-by-step how to self-collect through written instructions diagrams, and tutorial videos until they fully understood the study procedures. Then a self-sampling kit (Aptima Multitest Swab Specimen Collection Kit, Hologic Inc., Marlborough MA, USA) was provided to each participant. Participants collected their own specimens in a private room and returned these to staff, then they underwent gynecological examination. After that, they were asked to complete the self-administered paper questionnaire about their acceptability of the self-sampling procedure.

Data collection

A self-administered questionnaire was developed using a validated structured questionnaire from the literature review of similar published studies to cover critical areas. Data collection consisted of three main parts. The first part was used to collect demographic characteristics information including age, education level, monthly income, marital status, menstruation, and previous Pap test experience. The second part assessed the acceptability of HPV self-sampling which included five indices: easy and convenient to perform, less embarrassment, not painful, confidence in performing the procedure, and would recommend self-sampling to a friend or relative. A five-point Likert scale was used to collect data. The rating scales range from 1 to 5 as follows: 1= "Strongly disagree", 2= "Disagree", 3= "Neither agree nor disagree", 4= "Agree", 5= "Strongly agree". A score point was used to classify into two groups of participants. Those who scored 4 or 5 were considered as having a positive response (deemed as acceptable), whereas those who scored below were categorized as negative responses toward HPV self-sampling for cervical cancer screening. In the third part, participants were asked about their preference for self-sampling compared with clinician-collected samples for the purpose of routine cervical cancer screening. The questionnaire took approximately 10-15 minutes to complete all questions.

Statistical analysis

Data was collected using Microsoft Excel and then exported to the Statistical Package for Social Science program, version 26 (IBM SPSS statistics 26) for final analysis. Cronbach Alpha coefficient was used to assess the internal consistency of the questionnaire, a value of ≥ 0.7 indicated good reliability of a construct. Descriptive results for categorical variables were presented as frequencies and percentages while continuous variables were expressed as mean and standard deviation. The association between independent variables and preference for HPV self-sampling was evaluated using multivariate logistic regression. The adjusted odds ratios with 95% confidence intervals (CI) were calculated as a measure of association. The P-value of less than 0.05 was considered statistically significant.

Results

Participant characteristics

Of 268 eligible participants, 265 of them completed the survey questionnaire. The demographic characteristics of participants were shown in Table 1. Approximately 45% of participants were 50 years or older. The mean age was 47.5 years with a standard deviation of 8.3 years. Most participants (56.2%) were holding a diploma and bachelor's degree, 63.8% had a monthly income of over 30,000 Bath and 65.7% were married. Concerning their health information, 56.6% had regular menstrual and 91.7% had ever been screened for cervical cancer.

Acceptability of HPV self-sampling

The acceptability of HPV self-sampling was evaluated in five attitude indices as shown in Table 2. Overall, most of the participants provided a positive response (scored 4 and 5 on the Likert scale) in all five indices. 93.6% (248) of participants declared that the self-sampling was easy and convenient to perform, 86.4% (229) felt less embarrassed with the self-sampling, 92.5% (245) considered it did not cause pain, 73.2% (194) expressed confidence in performing the procedure, and 89.4% (237) stated that they would recommend self-test to a friend or relative.

Table 1. Demographic Characteristics of Study Participants (N=265)

Characteristics	Number (%)
Age (years)	
30-39	52 (19.6)
40-49	92 (34.7)
≥50	121 (45.7)
Median	48
Mean (SD; range)	47.5 + 8.3
Education	
Primary	13 (4.9)
Secondary	25 (9.4)
Diploma and bachelor's degree	149 (56.2)
Master and higher	78 (29.4)
Monthly income (THB)	
0-9,999	26 (9.8)
10,000-29,999	70 (26.4)
≥30,000	169 (63.8)
Marital status	
Married	174 (65.7)
Single	63 (23.8)
Separated, divorced, or widowed	28 (10.6)
Menstruation	
Regular menstruation	150 (56.6)
Menopause	115 (43.4)
Experiences of cervical screening (Pap test)	
No	22 (8.3)
Yes	243 (91.7)

Preference for HPV self-sampling and its associated factors

All participants were asked to indicate their preference of method for cervical cancer screening, 33.6% (89) preferred clinician sampling, and 66.4% (176) preferred self-sampling as routine screening. The multivariable logistic regression was conducted to access independent variables affecting the preference for self-sampling (Table 3). The results showed that participants aged 30-39 were significantly more likely to prefer self-sampling as compared to those older than 40 years. Single women were more willing to use a self-sampling device as a routine screening compared to married women (adjusted OR 2.30; 95% CI 1.325 to 9.761, p-value = 0.043). However, the results in this study showed that the preference for self-sampling had no correlation with the level of education, monthly income, menstruation, and previous Pap test experience.

Participants' attitudes and feelings regarding the HPV self-sample method were also included in the model. Feelings of less embarrassment and confidence in performing the procedure were the key factors that significantly influenced the preference for self-sampling in the multivariable analysis with p-values equal to 0.041 and 0.001 respectively.

Table 2. Acceptability of Participants after Performing a Self-sampling Procedure (N=265)

Attitude indices		Number (%)
Easy and convenient to perform		
	No	17 (6.4)
	Yes	248 (93.6)
Less embarrassment		
	No	36 (13.6)
	Yes	229 (86.4)
Not painful		
	No	20 (7.5)
	Yes	245 (92.5)
Confidence in performing the procedure		
	No	71 (26.8)
	Yes	194 (73.2)
Would recommend self-sampling to a friend or relative		
	No	28 (10.6)
	Yes	237 (89.4)

Note, Responding "Yes" to each index implied a positive response.

Discussion

The present study was conducted to evaluate women's acceptability of HPV self-sampling and explored the key factors that could influence the preference for self-sampling. Overall, the results demonstrate that the majority of participants had a positive attitude toward self-sampling, more than 70% expressed that the self-sampling method was easy to perform, less embarrassing, and not painful. Also, they feel confident in their ability to self-sample correctly and would recommend this method to a friend or relative. These responses indicated that self-sampling was a well-accepted method among our study participants and will be a powerful strategy to overcome barriers to cervical cancer screening. These results are in line with those of previous studies (Sultana et al., 2015; Mulki and Withers, 2021; Chaw et al., 2022). In addition, the assessment of preference for self-sampling revealed that most of the participants (66.4%) were willing to repeat the HPV self-sampling as a routine cervical screening test. Our finding was consistent with studies undertaken in the USA, Greece, and Korea indicating the women's preference for self-sampling ranged from 51 to 86% (Mao et al., 2017; Chatzistamatiou et al., 2017; Shin et al., 2019).

Multivariate analysis showed that various variables were associated with a preference for HPV self-sampling. Women in the younger age group were significantly more likely to prefer self-sampling compared to the older age group. There is the possibility that the older age group may have experienced conventional smears previously and feel more confident with clinician sampling. This agrees with the Netherlands' study which reported that younger women preferred self-sampling higher than older women and they felt this method was able to reduce embarrassment (Bosgraaf et al., 2014). Women's marital status also presented a correlation with their preference for self-sampling. Single women were two times more

Table 3. Association of Factors with a Preference for HPV Self-sampling

Variables	Adjusted odds ratio (95% CI)*	p-value
Age (years)		
30-39	1	
40-49	0. 240 (0.075-0.771)	0.017
≥50	0.076 (0.012-0.490)	0.007
Education		
Primary	1	
Secondary	0.856 (0.153-4.796)	0.86
Diploma and bachelor's degree	0.668 (0.145-3.079)	0.605
Master's degree or higher	0.722 (0.140-3.730)	0.698
Monthly income (THB)**		
0-9,999	1	
10,000-29,999	0.703 (0.218-2.270)	0.555
≥30,000	0.589 (0.186-1.861)	0.367
Marital status		
Married	1	
Single	2.300 (1.325-9.761)	0.043
Separated, divorced, or widowed	1.624 (0.696-4.841)	0.327
Menstruation		
Regular menstruation	1	
Menopause	0.711 (0.141-3.578)	0.679
Experiences of cervical screening (Pap test)		
No	1	
Yes	0.332 (0.065-1.695)	0.185
Easy and convenient to perform		
Negative	1	
Positive	1.025 (0.323-3.256)	0.966
Less embarrassment		
Negative	1	
Positive	2.532 (1.012-6.337)	0.041
Not painful		
Negative	1	
Positive	0.277 (0.068-1.125)	0.073
Confidence in performing the procedure		
Negative	1	
Positive	3.170 (1.635-6.146)	0.001
Recommend self-sampling to a friend or relative		
Negative	1	
Positive	0.362 (0.118-1.117)	0.077

CI, confidence interval; * All variables included in the multivariate regression model; ** 1 USD ≈ 36.6 THB

likely to use self-sampling than married women. This may be because some single women feel embarrassed about exposing private body parts during a clinician's examination. On the other hand, studies in Malaysia (Ma'som et al., 2016) and England (Waller et al., 2006) revealed that there was no significant association between marital status and willingness to self-collect. These findings illustrate different cultural beliefs may influence women's acceptability of self-sampling. In terms of participants' feelings about the experience of using self-sampling, we found that feeling less embarrassed and confident in performing the tests were the independent factors that influenced preference for self-sampling. The feeling of embarrassment is commonly viewed as a static psychosocial barrier that may play a great role in the cervical screening program (Teng et al., 2014). Similar to previous studies from Thailand, Oranratanaphan (2014) indicated that 80% of participants feel less embarrassed while using brush-type self-sampling devices. Also, Phoolcharoen (2009) reported that Thai women preferred

the self-sample method because it does not cause embarrassment. Self-confidence in the ability to collect samples was also influential. Several studies showed that women preferred clinician sampling over self-sampling because of a lack of confidence in performing the test (Williams et al., 2017; Nishimura et al., 2021). Furthermore, some women worried about they might fail to take the sample from their vagina, and it would lead to an incorrect result (Kohler et al., 2019).

The presented study has a few limitations. First, our findings might represent a biased population because these women were recruited from Check-up Clinic and Gynecological Oncology Clinic. Besides, almost all the participants (91.7%) had ever undergone cervical cancer screening by clinicians. This indicated that they had awareness of good health behavior practices. Second, the small sample sizes might not be generalizable to the larger population. Therefore, future work should aim to include a diverse population, especially those who are never or under-screened because they felt embarrassed when examined by clinicians.

In conclusion, most of our study population accepted HPV self-sampling for cervical cancer screening and preferred to use this method as a routine screening test in the future. Our findings demonstrated the acceptability and feasibility of HPV self-sampling to increase participation in cervical cancer screening. However, the implementation of HPV self-sampling as a primary screening needs to consider several issues including raising knowledge and awareness of cervical screening and providing information on how to collect the sample.

Author Contribution Statement

SS conceived the study and initiated the study design. P Ploysawang, SP, WK, CT, KS, and PP carried out the data collection. P Ploysawang designed the analytical approach, performed the statistical analysis, interpreted the data, and drafted the manuscript under the supervision of SS. All authors contributed to the article and approved the submitted version.

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Ethics approval

This study was approved by the Ethics Committee of the National Cancer Institute (reference EC COA 026/2020). Informed consent was obtained from all participants prior to participation.

Conflict of interest

All the authors declare that no conflict of interest.

References

Aoki ES, Yin R, Li K, et al (2020). National screening programs for cervical cancer in Asian countries. *J Gynecol Oncol*, **31**, e55.

Bosgraaf RP, Ketelaars PJW, Verhoef VMJ, et al (2014). Reasons for non-attendance to cervical screening and preferences for HPV self-sampling in Dutch women. *Prev Med*, **64**, 108–13.

Bruni L, Serrano B, Roura E, et al (2022). Cervical cancer screening programmes and age-specific coverage estimates for 202 countries and territories worldwide: a review and synthetic analysis. *Lancet Glob Health*, **10**, e1115–27.

Chaw L, Lee HFS, Ja'afar NIH, Lim E, Sharbawi R (2021). Reasons for non-attendance to cervical cancer screening and acceptability of HPV self-sampling among Bruneian women: A cross-sectional study. *PLoS One*, **17**, e0262213.

Chatzistamatiou K, Chatzaki E, Constantinidis T, et al (2017). Self-collected cervicovaginal sampling for site-of-care primary HPV-based cervical cancer screening: a pilot study in a rural underserved Greek population. *J Obstet Gynaecol*, **37**, 1059–64.

Chorley AJ, Marlow LAV, Forster AS, Haddrell JB, Waller J, (2017). Experiences of cervical screening and barriers to participation in the context of an organised programme: a systematic review and thematic synthesis. *Psychooncology*, **26**, 161–72.

George J (2021). Factors influencing utilization of cervical cancer screening services among women – A cross-sectional survey. *Clin Epidemiol Glob Health*, **11**, 100752.

Haile EL, Woldemichael GB, Lebelo RL, Van geertruyden JP, Bogers JP (2020). Comparison and acceptability of HPV self-collected cervical cancer samples versus doctor-collected samples in Africa: a systematic review. *PAMJ Clin Med*, **2**, doi: 10.11604/pamj-cm.2020.2.82.20532.

Kohler RE, Elliott T, Monare B, et al (2019). HPV self-sampling acceptability and preferences among women living with HIV in Botswana. *Int J Gynaecol Obstet*, **147**, 332–8.

Mao C, Kulasingam SL, Whitham HK, et al (2017). Clinician and Patient Acceptability of Self-Collected Human Papillomavirus Testing for Cervical Cancer Screening. *J Womens Health (Larchmt)*, **26**, 609-15.

Ma'som M, Bhoo-Pathy N, Nasir NH, et al (2016). Attitudes and factors affecting acceptability of self-administered cervicovaginal sampling for human papillomavirus (HPV) genotyping as an alternative to Pap testing among multiethnic Malaysian women. *BMJ Open*, **6**, e011022.

Mukem S, Meng Q, Sriplung H, Tangcharoensathien V, (2015). Low Coverage and Disparities of Breast and Cervical Cancer Screening in Thai Women: Analysis of National Representative Household Surveys. *Asian Pac J Cancer Prev*, **16**, 8541-51.

Mulki AK, Withers M (2021). Human Papilloma Virus self-sampling performance in low- and middle-income countries. *BMC Womens Health*, **21**, https://doi.org/10.1186/s12905-020-01158-4

Nishimura H, Yeh PT, Oguntade H, E Kennedy C, Narasimhan M (2021). HPV self-sampling for cervical cancer screening: a systematic review of values and preferences. *BMJ Global Health*, **6**, e003743.

Onuma T, Kurokawa T, Shinagawa A, Chino Y, Yoshida Y (2020). Evaluation of the concordance in HPV type between self- and physician-collected samples using a brush-based device and a PCR-based HPV DNA test in Japanese referred patients with abnormal cytology or HPV infection. *Int J Clin Oncol*, **25**, 1854–60.

Oranratanaphan S, Termrungruanglert W, Khemapech N (2014). Acceptability of self-sampling HPV testing among Thai

women for cervical cancer screening. *Asian Pac J Cancer Prev*, **15**, 7437-41.
Petignat P, Faltin DL, Bruchim I et al, (2007). Are self-collected samples comparable to physician-collected cervical specimens for human papillomavirus DNA testing? A systematic review and meta-analysis. *Gynecol Oncol*, **105**, 530-5.
Phoolcharoen N, Kantathavorn N, Krisorakun W, et al (2018). Acceptability of Self-Sample Human Papillomavirus Testing Among Thai Women Visiting a Colposcopy Clinic. *J Community Health*, **43**, 611-5.
Rojanamatin J, Ukranun W, Supaattagorn P, et al (2021). Cancer in Thailand Vol. X, 2016-2018. Bangkok: National Cancer Institute. [cited 1 July 2022]. Available from: http://www.nci.go.th.
Rossi PG, Marsili LM, Camilloni L, et al (2011). The effect of self-sampled HPV testing on participation to cervical cancer screening in Italy: a randomised controlled trial (ISRCTN96071600). *Br J Cancer*, **104**, 248–54.
Serrano B, Ibanez R, Robles C, et al (2022). Worldwide use of HPV self-sampling for cervical cancer screening. *Prev Med*, **154**, 106900.
Shin HY, Lee B, Hwang SH, et al (2019). Evaluation of satisfaction with three different cervical cancer screening modalities: clinician-collected Pap test vs. HPV test by self-sampling vs. HPV test by urine sampling. *J Gynecol Oncol*, **30**, e76.
Simo RT, Tchakounte1 CK, Kamdje AHN, et al (2021). Cervical Cancer Awareness and Detection of Precancerous Lesions at Two District Health Centres in the West Region of Cameroon. *Asian Pac J Cancer Care*, **6**, 263-9.
Sultana F, Mullins R, English RD, et al (2015). Women's experience with home-based self-sampling for human papillomavirus testing. *BMC Cancer*, **15**, DOI 10.1186/s12885-015-1804-x.
Teng FF, Mitchell SM, Sekikubo M, et al (2014). Understanding the role of embarrassment in gynaecological screening: a qualitative study from the ASPIRE cervical cancer screening project in Uganda. *BMJ Open*, **4**, e004783.
Waller J, McCaffery K, Forrest S, et al (2006). Acceptability of unsupervised HPV self-sampling using written instructions. *J Med Screen*, **13**, 208–13.
Williams D, Davies M, Fiander A, et al (2017). Women's perspectives on human papillomavirus self-sampling in the context of the UK cervical screening programme. *Health Expect*, **20**, 1031–40.
Yeh PT, Kennedy CE, Vuyst HD, Narasimhan M (2019). Self-sampling for human papillomavirus (HPV) testing: a systematic review and meta-analysis. *BMJ Global Health*, **4**, e001351.