Original Article

Comparison of Satisfaction Between Menstrual Pad-Based HPV Self-Collection and Clinician-Collected HPV DNA Testing in Thai Women

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Abstract

OBJECTIVES: Cervical cancer remains a significant public health concern in Thailand, where participation in screening programs is limited due to psychological, cultural, and logistical barriers. Menstrual pad-based HPV self-collection (Q-pad) presents a non-invasive, private, and potentially acceptable alternative to clinician-collected HPV testing. This study aimed to compare the acceptability of Q-pad self-collection with clinician-collected thin-layer liquid-based HPV DNA testing, and to explore factors influencing women's screening preferences.

MATERIALS AND METHODS: A cross-sectional study was conducted among 158 Thai women aged ≥35 years undergoing annual health check-ups. Each participant underwent both clinician-collected HPV DNA testing and Q-pad self-collection at home. Satisfaction levels were assessed using a five-point Likert scale, and qualitative feedback was collected through open-ended responses. Descriptive analysis was performed to compare satisfaction levels and identify key themes related to user preferences and barriers.

RESULTS: Most participants (83.5%) reported equal satisfaction for both methods. For the Q-pad test, 91.8% of participants rated the experience as "very good" or "excellent," while 98.1% did so for the clinician-collected test. A minority expressed a preference, with 13.3% favouring clinician-collection due to perceived accuracy and 3.2% preferring self-collection for its privacy and comfort. Both screening methods received high levels of satisfaction. For the Q-pad test, 91.8% of participants rated the experience as "very good" or "excellent," while 98.1% did so for the clinician-collected test.

CONCLUSION: Q-pad self-collection demonstrated high levels of participant satisfaction, nearly comparable to clinician-collected HPV testing. These findings suggest that Q-pad self-collection is an acceptable alternative screening approach that could complement existing clinician-based programs

Keywords: HPV self-sampling; cervical cancer screening; Q-pad; menstrual pad-based testing; clinician-collected HPV test; screening preferences; Thai women; cultural barriers; health behavior

Cervical cancer is the fourth most common cancer among women globally, with an estimated 570,000 new cases and 311,000 deaths in 2018.[1] Low- and middle-income countries (LMICs) bear the highest burden, accounting for approximately 90% of all cases. In Thailand, cervical cancer remains a leading cause of illness and death among women, with an annual incidence of 11.3 per 100,000 as of 2021.[2] Persistent infection with high-risk human papillomavirus (HPV), particularly types 16 and 18, is responsible for approximately 70% of cases worldwide. Regular screening and early detection of precancerous cervical lesions can reduce mortality by up to 80%.[3]

In response, Thailand's Ministry of Public Health (MoPH) initiated a national cervical cancer screening program in 2005, utilizing Pap smears and Visual Inspection with Acetic Acid (VIA) for women aged 30–60 years. This initiative significantly reduced the incidence rate from 23.4 per 100,000 in

1990 to 11.7 per 100,000 in 2014.[4,5] Nevertheless, participation remains suboptimal, with only 46–67% of eligible women attending regular screenings.[6] Barriers such as embarrassment, fear of pelvic examinations, low awareness, and limited access to healthcare services continue to hinder screening uptake.[7]

The Pap smear, introduced in the 1940s, has been a cornerstone in cervical cancer prevention worldwide.[8] However, its implementation—particularly in LMICs—is challenged by the need for trained professionals, laboratory infrastructure, and associated costs.[9] Additional obstacles identified among Asian populations include psychological concerns (e.g., fear of cancer diagnosis, mistrust in health systems), cultural taboos (e.g., preservation of virginity), and procedural discomfort (e.g., pain or feelings of exposure).[10-13] These issues contribute to low participation rates, especially in underserved populations.

To overcome these limitations, self-collection for HPV testing has emerged as a promising alternative. This method allows individuals to collect their own vaginal or cervical samples using swabs or brushes, providing a more accessible and private option. Studies have shown that self-collected samples are comparable in sensitivity and specificity to those collected by clinicians.[14,15] Self-collection offers advantages such as increased autonomy, reduced need for clinical infrastructure, and improved acceptability among women reluctant to undergo pelvic exams, especially in resource-limited settings.[15-17]

Despite these benefits, psychological barriers remain. Many women fear improper self-collection techniques, worry about sample adequacy, and express discomfort with vaginal insertion devices.[9,18] Cultural unfamiliarity with vaginal products—common in many Asian countries—further complicates adoption. Older women, in particular, report increased discomfort, while some individuals prefer conventional Pap smears or clinician-collected to ensure the sample is properly collected.[17,19]Additionally, the act of handling one's own bodily fluids may cause hesitation or emotional discomfort.

An innovative alternative for HPV screening is **menstrual pad–based self-collection,** such as the Q-pad. Because menstrual pads are culturally familiar, non-invasive, and part of routine personal hygiene, this approach helps reduce psychological resistance to vaginal insertion as well as embarrassment or stigma often associated with gynecologic examinations, particularly in contexts where reproductive health remains a sensitive topic. Menstrual pad–based sampling offers a discreet, comfortable, and inclusive option, making it especially suitable for women with trauma histories or conditions like vaginismus.[20,21] By enhancing autonomy and reducing procedural anxiety, this method has the potential to improve participation in cervical cancer screening programs. **The Q-pad Collection Kit** is specifically designed for this purpose, integrating a dried blood spot (DBS) strip into a menstrual pad that can be worn during heavy flow days, then returned to the laboratory for analysis. This non-invasive method eliminates the need for speculum examination and has been reported in previous studies to achieve high levels of satisfaction and acceptability, underscoring its promise as a feasible alternative to clinician-collected HPV testing.

Despite growing interest in self-collection, a critical research gap persists regarding factors influencing engagement with different screening methods. Individual preferences, cultural attitudes, socioeconomic status, and healthcare accessibility play crucial roles in determining participation, yet comparative evidence between clinician-collected and self-collection remains limited.[22] Understanding these factors is essential to inform targeted interventions that increase screening uptake and reduce cervical cancer burden worldwide. This study aims to evaluate the acceptability of menstrual pad-based HPV self-collection (Q-pad) in comparison with clinician-administered liquid-based HPV DNA testing. Specifically, it seeks to compare levels of participant satisfaction between the two approaches and to examine participants' preferences regarding each method of HPV testing.

Material and Methods

The study employed a convenience sample of 158 women who were recruited from multiple Health Design Centers at Bangkok Hospital between October and December 2024. Data collection was conducted using structured, self-administered questionnaires.

Inclusion Criteria Participants were eligible to take part in the study if they met the following criteria:

1. Female employees aged 35 years and above who underwent an annual health check-up at the hospital.
2. Regular menstrual cycles, defined as having an average cycle every 25 to 35 days.
3. No prior history of testing positive for HPV infection.

Exclusion Criteria Participants were excluded from the study if they met any of the following conditions:

1. Inability to collect samples within the designated timeframe.
2. History of allergy or irritation from using standard sanitary pads.
3. Menstrual blood sample lost during transportation.

This comparative, cross-sectional study was conducted among female employees attending their annual health check-up at a tertiary care hospital in Thailand. Eligible participants were women aged 35 years and older, with regular menstrual cycles (defined as an average cycle every 25–35 days), no prior history of HPV positivity, and the ability to provide informed consent. Exclusion criteria included inability to complete the questionnaire, failure to collect the self-sample as scheduled, known allergies to sanitary pads, or loss of the menstrual blood sample during transport.

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Participants were approached by trained research personnel and provided with detailed information about the study. Written informed consent was obtained prior to participation. Baseline demographic and gynaecologic history were collected using a structured questionnaire.

Each participant underwent **both** of the following cervical cancer screening procedures:

1. **Clinician-collected thin-layer liquid-based HPV DNA testing,** performed by a gynecologist at the healthcare facility during the annual health check-up.
2. **Self-sampling using the Q-pad**, a menstrual pad-based collection device used at home during menstruation.

Participants received a Q-pad kit containing two collection pads, illustrated usage instructions, and a secure return package. They were instructed to apply the first Q-pad on the third day of menstruation, in the same manner as a regular sanitary pad, ensuring the sample collection strip was properly positioned. After the menstrual blood fully saturated the collection zone, the dry blood strip was removed, placed into the provided container, and sealed. The process was repeated using the second Q-pad. Both strips were then returned to the research team via the check-up counter or postal services for centralized laboratory testing. The samples were analyzed for high-risk HPV genotypes, including types 16 and 18.

After completing both tests, participants were asked to complete a post-screening questionnaire to assess their perceptions and preferences. The questionnaire included a five-point Likert scale evaluating ease of use, physical and emotional comfort, confidence in test accuracy, and overall preference between the two methods. Open-ended questions captured qualitative feedback on motivators, concerns, and perceived barriers to self-sampling.

Data Collection

Data collection was carried out in three phases: pre-screening, screening, and post-screening.

Pre-screening phase: Eligible participants were identified during their annual health check-up at a tertiary care hospital. After providing written informed consent, participants completed a baseline questionnaire collecting demographic information (age, education level, marital status), gynecologic history (menstrual regularity, past screening experience), and general knowledge about cervical cancer and HPV.

Screening Phase: Each participant underwent two HPV screening methods:

1. **Clinician-collected thin-layer liquid-based HPV DNA** test
2. **Self-collected Q-pad test.**

Both types of samples were submitted to the laboratory, where they were recorded, assessed for adequacy, and analyzed for high-risk HPV types, including HPV 16, HPV 18, and other oncogenic strains. All results were documented and linked to individual participant codes.

Post-screening phase: Following completion of both screening methods, participants were asked to complete a post-screening questionnaire. This instrument employed a five-point Likert scale to assess perceived ease of use, comfort, convenience, confidence in result accuracy, and overall preference for each screening method.

All data were anonymized, coded, and securely stored for analysis. The structured design allowed for both quantitative and qualitative data collection to provide a comprehensive understanding of participant experiences and method acceptability.

Result

A total of 158 participants completed both the self-collected HPV test using the Q-pad and the clinician-collected thin-layer liquid-based HPV DNA test. Satisfaction levels and qualitative feedback were collected and analyzed to compare the acceptability and user experience of both methods.

Quantitative Satisfaction Ratings

Overall satisfaction was high for both screening methods. For the self-collected Q-pad test, 145 participants (91.8%) rated their experience as very good (n = 73, 46.2%) or excellent (n = 72, 45.6%). Twelve participants (7.6%) rated the experience as good, while one participant (0.6%) rated it as fair; none rated it as poor (Table 1).

Table 1: Participant Satisfaction with Self-Collected Q-Pad Test vs. Clinician-Collected Pap Test (n = 158).

Satisfaction Level	Self-Collected Q-Pad Test (n, %)	Clinician-Collected Pap Test (n, %)
Poor	0 (0.0)	0 (0.0)
Fair	1 (0.6)	0 (0.0)
Good	12 (7.6)	3 (1.9)
Very Good	73 (46.2)	78 (49.4)
Excellent	72 (45.6)	77 (48.7)
Total	158 (100)	158 (100)

For the clinician-collected HPV DNA test, a similar pattern of high satisfaction was observed. A total of 155 participants (98.1%) rated the experience as very good (n = 78, 49.4%) or excellent (n = 77, 48.7%). Only three participants (1.9%) rated the experience as good, with no reports of fair or poor satisfaction.

When comparing satisfaction levels between the two methods on an individual basis, 132 participants (83.5%) rated both tests equally, 21 participants (13.3%) reported higher satisfaction with the clinician-collected test, and 5 participants (3.2%) indicated a preference for the self-collected Q-pad (Table 2).

Qualitative Feedback

Open-ended responses revealed distinct themes for each screening method. The **self-collected Q-pad test** was frequently described as *convenient, easy to use, private,* and *non-invasive.* Participants appreciated the ability to perform the test at home and the absence of a speculum or pelvic examination, with comments such as *"Convenient," "No need for a speculum examination,"* and "No need to undergo a pelvic exam." This method was particularly suitable for participants with time constraints or discomfort with gynecologic exams.

In the paired comparison, the majority of participants (83.5%) reported equal satisfaction with both methods, whereas 13.3% expressed higher satisfaction with the clinician-collected test and 3.2% preferred the self-collected Q-pad (see Table 2).

Table 2: Paired Satisfaction Comparison Between Self-Collected and Clinician-Collected Methods (n = 158).

Satisfaction Comparison	n (%)
Self-collected < Clinician-collected	21 (13.3)
Self-collected = Clinician-collected	132 (83.5)
Self-collected > Clinician-collected	5 (3.2)
Total	158 (100)

However, several participants noted concerns about the **design of the Q-pad,** specifically mentioning that the **absorbent strip was too thin or short,** which led to doubts about sample adequacy ("The pad was too thin," "The pad was too small in length to provide sufficient coverage"). A small number of participants also reported **minor skin irritation or allergic** reactions following use.

In contrast, the **clinician-collected HPV test** was consistently associated with **accuracy, trust, and professionalism.** Common phrases included "*Trustworthy*," "*Highly accurate*," and "*Conducted by a medical professional*" reflecting confidence in the physician's role in ensuring sample adequacy and reliable results. Nonetheless, several participants expressed discomfort with the **speculum-based pelvic examination,** citing embarrassment or physical unease during the procedure.

Discussion

This study investigated participant satisfaction and engagement with two cervical cancer screening methods: the self-collected Q-pad test and the clinician-collected thin-layer liquid-based HPV DNA test. Overall, both methods were well accepted; however, psychosocial and cultural factors influenced participant preferences, with a slight tendency to favor clinician-administered testing.

1. Trust in Clinicians and Confidence in Procedure Accuracy

Participants expressed greater confidence in the accuracy of clinician-administered testing, citing trust in medical expertise and the assurance of proper sample collection. This finding aligns with previous research, which reported that users often perceive clinician-collected samples as more reliable due to direct medical oversight and standardization of technique.[17] Conversely, some participants in our study doubted their ability to collect adequate samples using the Q-pad, despite instructions, reflecting a lack of self-efficacy—a known barrier to self-collection uptake.[22]

2. Importance of Doctor–Patient Interaction

The ability to ask questions, receive clarification, and feel emotionally supported during clinician-based screening was highly valued by participants. These interpersonal interactions have been shown to reduce screening-related anxiety and enhance compliance.[18] Similar findings have been reported in Asian contexts, where direct communication with healthcare providers plays a central role in reinforcing the perceived legitimacy and trustworthiness of medical interventions.[10]

3. Cultural Attitudes and Learned Health Behaviors

Cultural norms played a significant role in shaping participant perceptions. Many participants were raised to believe that medical procedures should occur within formal healthcare settings. Such beliefs are common in many Asian societies, where there is a deep-rooted trust in institutional healthcare and hesitancy toward self-directed medical care.[12] Even when presented with accurate information, cultural conditioning may override logical reassurance, contributing to the preference for clinician-led screening.[11]

4. Misconceptions Regarding the Q-pad Device

Despite its familiar design, several participants misunderstood the purpose of the Q-pad, perceiving it as a menstrual hygiene product rather than a medical diagnostic tool. Prior studies have noted similar confusion with other self-collection devices, particularly when they resemble routine hygiene items[9]. These misconceptions highlight the need for clearer product labeling and targeted education that emphasizes the diagnostic function of such tools.[16]

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5. Enhancing Accessibility and Effectiveness of Self-Collection Methods

To increase the adoption of self-collection methods, strategic interventions must address psychological, informational, and cultural barriers. Studies suggest that educational materials—including videos, pictorial instructions, and community-based demonstrations—can significantly improve user confidence and comprehension.[14] Additionally, endorsement from trusted healthcare providers has been shown to increase acceptance of self-sampling, especially in hesitant populations.[23] Public health strategies should position self-collection not as a replacement, but as a complementary option to traditional methods, thereby respecting diverse preferences and improving screening coverage.[15]

Conclusion

This study demonstrates that both clinician-collected and Q-pad self-collected HPV screening methods were well accepted among participants. While clinician-based testing was generally preferred due to perceptions of greater accuracy and trust in professional oversight, the Q-pad method was valued for its privacy, convenience, and non-invasiveness. These complementary attributes highlight the importance of offering multiple screening options to address diverse user preferences.

However, broader adoption of self-collection remains limited by psychological concerns, cultural attitudes, and misunderstandings regarding device use. To maximize the impact of self-sampling in cervical cancer prevention, it is essential to implement multi-level strategies that promote health literacy, foster healthcare provider endorsement, and deliver culturally tailored education. Such measures will enhance screening accessibility, support equitable participation, and contribute to national and global efforts to reduce cervical cancer incidence.

Suggestions for Practice and Policy

Findings from this study offer actionable recommendations to enhance cervical cancer screening uptake by integrating self-collection methods with existing clinical approaches. The following strategies are proposed for future policy and program development:

1. **Offer Self-Collection as a Complementary Screening Option**
   Rather than replacing clinician-based testing, self-collection methods such as the Q-pad should be offered as an alternative to empower choice and accommodate individual preferences. Research has shown that providing options increases screening participation, particularly among under-screened populations.[14]
2. **Develop Culturally Tailored Educational Materials**
   Misunderstandings regarding self-collection devices highlight the need for clear, culturally sensitive communication. Visual guides, simplified language, and locally relevant messaging have been shown to improve comprehension and engagement with self-sampling interventions.[16, 22]
3. **Involve Healthcare Providers in Promoting Self-Sampling**
   Physician and nurse endorsement significantly influences patient trust and willingness to adopt self-collection. Integrating provider counseling into routine services can normalize self-sampling and increase confidence in its accuracy.[9]
4. **Engage Community-Based Networks for Outreach and Support**
   Utilizing community health workers and peer educators is effective in delivering HPV-related health education, especially in rural or resource-limited settings. Community engagement helps address sociocultural barriers and builds trust among marginalized groups.[7,24]
5. **Incorporate Self-Collection into National Screening Guidelines**
   National policies should formally include validated self-collection methods as part of cervical cancer prevention strategies. WHO recommends incorporating self-sampling to expand access and meet global elimination goals.[25]
6. **Conduct Further Implementation and Cost-Effectiveness Research**
   To ensure sustainable adoption, future studies should evaluate the feasibility, cost-effectiveness, and long-term impact of integrating self-collection into public health systems. Evidence from such studies will inform effective scale-up and resource allocation.[15,26]

By addressing educational, cultural, and system-level barriers, these measures can improve screening coverage and support more equitable access to cervical cancer prevention.

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