Society of Medical Education & Research

2025, Volume 5, Page No: 199-207
ISSN: 3108-4818

International Journal of Social and Psychological Aspects of Healthcare

Pap testing and HPV Assessment Patterns among White, Black, and Hispanic Women: Insights Derived from Survey Data

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Abstract

Although the Pap smear, HPV vaccination, and HPV testing serve as key measures for maintaining cervical health, the American Cancer Society (ACS) has lately revised its guidelines for preventing cervical cancer by prioritizing primary HPV testing in screening protocols. This research explores healthcare professionals' opinions on these revisions and assesses how effectively they have influenced women in the United States. Findings are drawn from an original dual-survey analysis involving women's health clinicians (N = 558) and a diverse group of White, Black, and Hispanic females (N = 1900). Results indicate that only a small proportion of clinicians (18%, CI = 14%, 21%) consider standalone HPV testing sufficient for screening cervical cancer, whereas nearly all (96%, CI = 94%, 97%) believe patients ought to undergo routine combined Pap and HPV examinations. Rates of Pap smear uptake are lower among Black women (88%, CI = 86%, 91%) and Hispanic women (87%, CI = 84%, 89%) relative to White women (94%, CI = 92%, 96%). Just 35% (CI = 33%, 37%) of participants report ever receiving an HPV test, with comparable figures across racial/ethnic groups. Provider suggestions for combined Pap-HPV testing show similar levels for White (29%, CI = 25%, 33%) and Hispanic women (26%, CI = 23%, 29%), but significantly reduced rates for Black women (22%, CI = 18%, 25%). These trends remain significant even after adjusting for key sociodemographic factors via logistic regression analyses. Persistently reduced Pap smear utilization among Black and Hispanic women, alongside limited HPV testing overall, may impede progress in lowering cervical cancer rates and deaths, especially affecting Hispanic and Black populations disproportionately.

Keywords: Pap testing, HPV, American Cancer Society (ACS), Sociodemographic factors

Introduction

Over the past ten years, recommendations for screening cervical cancer have evolved substantially. Both the 2018 U.S. Preventive Services Task Force (USPSTF) guidelines and the 2012 ACS version advised Pap smears every three years for individuals aged 21–29, along with various options for those aged 30–65 [1, 2]—including Pap smears every 3 years, standalone HPV testing every 5 years, or combined HPV-Pap testing every 5 years. In contrast, the 2020 ACS update designates standalone HPV testing every five years as the primary approach, deeming Pap smears every 3 years acceptable only in settings with restricted HPV testing availability [3].

For many years, the Pap smear represented the primary method for detecting cervical cancer [4], proving effective in identifying precancerous cervical alterations. Yet, due to HPV's central causative role in cervical cancer [5], screening options have broadened to incorporate HPV testing and the preventive HPV vaccine [4], influencing the ACS's shift toward prioritizing HPV testing. Nevertheless, integrating HPV testing into routine care faces numerous obstacles, such as requirements for specialized equipment and lab facilities, new billing procedures, and hesitancy from both clinicians and patients [6].

Access this article online https://smerpub.com/

Received: 14 April 2025; **Accepted:** 16 August 2025

How to cite this article: Harris BK, Wood EJ, Price DS. Pap testing and HPV Assessment Patterns among White, Black, and Hispanic Women: Insights Derived from Survey Data. Int J Soc Psychol Asp Healthc. 2025;5:199-207. https://doi.org/10.51847/Y9e8rc9cgG

Given the latest modifications to ACS cervical cancer screening protocols, it is essential to evaluate clinicians' perspectives on these updates, their views on the effectiveness of standalone HPV testing versus combined HPV-Pap approaches, and patients' actual experiences with screening to gain insight into the evolving field of cervical cancer prevention.

The Pap smear has markedly lowered rates of cervical cancer occurrence and fatality [4, 7-9], and emerging evidence supports HPV testing's superiority in separating low-risk individuals (high-risk HPV negative, allowing extended intervals) from those requiring closer observation (high-risk HPV positive) [10-13]. That said, cases of HPV-negative cervical cancers exist [14, 15], often carrying worse outcomes than HPV-positive ones [16], underscoring the ongoing value of Pap smears in prevention strategies.

The ACS cervical cancer screening recommendations aim to benefit all individuals with a cervix, yet trials underpinning HPV testing often underrepresented Black and Hispanic women as well as those from lower socioeconomic backgrounds [3]. This raises concerns, as Black and Hispanic women face higher risks of advanced-stage diagnosis and elevated mortality from cervical cancer compared to White women [17-19]. Existing data also reveal variations in utilization of preventive measures, with Black and Hispanic women showing differing patterns in screening and vaccination [17, 20-25]. Moreover, these groups exhibit reduced awareness of Pap smears [26, 27], lesser familiarity with HPV vaccination, and lower rates of knowing about HPV overall [25, 28-30] than White women. Additionally, Black and Hispanic patients less frequently receive clinician endorsements for HPV vaccination or Pap testing [31-34], despite the critical role of such recommendations in encouraging screening participation [31, 35-38]. Critically, Black and Hispanic women are also less prone to having consistent primary care providers than White women [39].

Prior research has highlighted systemic obstacles facing Black and Hispanic women in accessing Pap smears and HPV vaccinations, but less attention has been paid to potential inequities in HPV testing or combined HPV-Pap approaches. Drawing on a nationally representative dataset of White, Black, and Hispanic women, this study examines whether racial/ethnic differences extend to HPV testing and combined testing uptake, alongside ongoing gaps in Pap smear rates for Black and Hispanic women.

The 2020 ACS protocols extend intervals for low-risk individuals while ensuring ongoing vigilance for high-risk HPV positives. These shifts could guide clinical practice, but knowledge is limited regarding clinicians' acceptance of primary HPV testing and its integration into care. Through our clinician survey, we outline professionals' attitudes toward HPV testing and combined approaches. Although Pap smear and HPV vaccine utilization have been extensively researched, fewer investigations have detailed rates of Pap, HPV, and combined testing in diverse samples of Hispanic, Black, and White women. Thus, this work also documents uptake of these methods in such a cohort, including discussions with providers about Pap and HPV tests—particularly contrasting with the longstanding Pap smear—and potential sociodemographic variations in these interactions. Exploring these topics can illuminate the implications of adopting the newest ACS protocols and identify groups at risk of being underserved.

Materials and Methods

Participants

The Cervical Cancer Study (CCS), carried out by NORC at the University of Chicago in 2020, consists of two distinct surveys. The initial component—the Healthcare Providers' Survey—involved a sample of medical professionals (N = 558) drawn from Dynata's nonprobability online panel specifically for healthcare workers. This survey was administered exclusively in English via the web. Although participation in the Dynata panel may introduce some self-selection bias due to its nonprobability nature, the age distribution among respondents was broad and balanced (22% aged 25–45, 49% aged 45–59, and 27% aged 60 and older), reflecting diverse levels of experience in women's health. The gender breakdown was nearly equal (49% female, 51% male). Participants received an undisclosed financial incentive upon completion.

The second component—the Women's Survey—comprised a large, nationally representative sample of White, Black, and Hispanic women aged 21–65 (N = 1900), focusing on their encounters with cervical cancer-related examinations, procedures, and provider advice. The final dataset included White (N = 534), Black (N = 587), and Hispanic (N = 779) participants in this age range. This survey was available in both English and Spanish and conducted via web or telephone. Data were sourced from NORC's AmeriSpeak® Panel, with

respondents receiving a $2 incentive after finishing the questionnaire.

Sampling was stratified by age, race/ethnicity, education, and gender, with stratum sizes aligned to U.S. population proportions. Adjustments were made to account for anticipated variations in completion rates across demographic groups, ensuring the completed sample represented the target population. To bolster representation, the AmeriSpeak sample for Hispanic women aged 21–29 was augmented with respondents from Dynata's nonprobability opt-in panel (N = 139, incorporated into the overall Hispanic total of N = 799). Potential bias from this nonprobability supplement was mitigated through quota balancing on age and education, followed by appropriate weighting. The research protocol received approval from NORC's Institutional Review Board (IRB).

Variables

In the provider survey, clinicians were queried with two items: "Should women have both Pap and HPV tests as part of regular screening?" (Yes/No) and "Do you believe HPV screening alone is adequate for screening for cervical cancer?" (Yes/No). These items were newly developed and validated by the study team. Additional exploratory analyses incorporated providers' geographic region.

For the women's survey, primary items assessed whether participants had ever undergone a Pap test or an HPV test (Yes/No), whether they had discussed these tests with a clinician (Yes/No), whether a provider had recommended combined HPV–Pap testing (Yes/No), and the recency of their most recent Pap test (< 3 years ago, 3 + years ago). Recency was specifically captured via the question "When was your last Pap test?" and dichotomized as less than 3 years ago (= 1) versus 3 or more years ago (= 0). Precise wording for the other key questions appears alongside results in subsequent sections. Participants also provided information on race/ethnicity, age, education, marital status, employment, household structure, and income.

All survey items underwent pretesting (N = 48 for the Women's Survey; N = 25 for the Provider Survey) and refinement prior to full data collection.

Analytic approach

Analyses were performed using SAS version 9.4. Descriptive tabulations first quantified the percentage of providers who supported the ACS position that standalone HPV testing suffices for cervical cancer screening, as well as the percentage endorsing routine combined HPV–Pap testing. Similar tabulations were produced for women reporting ever having an HPV test, a Pap test, or a provider recommendation for combined HPV–Pap testing.

Group differences across Black, Hispanic, and White women in Pap test receipt, HPV test receipt, and provider recommendations for cervical prevention methods were evaluated using 95% confidence intervals around proportions. Logistic regression models (implemented via SAS PROC LOGISTIC) examined the odds of reporting a Pap test, an HPV test, or a combined testing recommendation by race/ethnicity and age group **(Table 3)**. Covariates in all models included race/ethnicity, age, education, household income, and access to a regular provider. All estimates were weighted to reflect the U.S. population of Black, Hispanic, and White women.

Results and Discussion

Clinician perspectives

The vast majority of clinicians (96%, CI = 0.94, 0.97) indicated that women should routinely receive both Pap and HPV tests during screening, while only 18% (CI = 0.14, 0.21) viewed standalone HPV testing as sufficient for detecting cervical cancer **(Table 1).** These results highlight a clear mismatch between providers' views on the sufficiency of primary HPV testing and the 2020 American Cancer Society guidelines.

Table 1. Clinician views on Pap and HPV testing (N = 558)

Variable	**(95% CI)**	**Proportion**
Should women undergo both Pap and HPV tests during routine screening? (1 = yes, 0 = no)	(0.94, 0.97)	0.96
Do you consider standalone HPV testing sufficient for cervical cancer screening? (1 = yes, 0 = no)	(0.14, 0.21)	0.18

Women's experiences

In our sample of women, a large majority reported having discussed a Pap test with a healthcare provider (88%) and having ever undergone a Pap test (92%) **(Table 2).** These findings demonstrate the extensive penetration of Pap testing as a method for cervical cancer screening. Considering the strong evidence supporting the role of

Pap tests in decreasing both cervical cancer occurrence and deaths [8], the broad dissemination and adoption of Pap testing can be regarded as a notable achievement in public health efforts focused on women's health.

Table 2. Proportion reporting discussion and testing by group

Variable	White (N = 534)	Black (N = 587)	Hispanic (N = 779)	Total (N = 1900)
Ever had a Pap test	Mean 0.94 (95% CI: 0.92–0.96)	Mean 0.88 (95% CI: 0.86–0.91)	Mean 0.87 (95% CI: 0.84–0.89)	Mean 0.92 (95% CI: 0.91–0.93)
Ever discussed Pap test with a healthcare provider	Mean 0.89 (95% CI: 0.86–0.92)	Mean 0.87 (95% CI: 0.84–0.89)	Mean 0.83 (95% CI: 0.81–0.86)	Mean 0.88 (95% CI: 0.86–0.89)
Ever had an HPV test	Mean 0.35 (95% CI: 0.31–0.39)	Mean 0.34 (95% CI: 0.30–0.38)	Mean 0.34 (95% CI: 0.31–0.38)	Mean 0.35 (95% CI: 0.33–0.37)
Ever discussed HPV test with a healthcare provider	Mean 0.35 (95% CI: 0.31–0.39)	Mean 0.44 (95% CI: 0.40–0.48)	Mean 0.39 (95% CI: 0.35–0.42)	Mean 0.37 (95% CI: 0.41–0.45)
Provider recommended Pap and HPV tests together	Mean 0.29 (95% CI: 0.25–0.33)	Mean 0.22 (95% CI: 0.18–0.25)	Mean 0.26 (95% CI: 0.23–0.29)	Mean 0.27 (95% CI: 0.25–0.29)

Although the majority of women have discussed Pap tests with a healthcare provider and have undergone the test, disparities still exist in these outcomes. Controlling for provider access, age, education, and household income, logistic regression analyses **(Table 3)** indicate that Black women (OR = 0.48, 95% CI = 0.29–0.78) and Hispanic women (OR = 0.56, 95% CI = 0.36–0.86) are less likely than White women to have ever received a Pap test, aligning with findings from prior studies [26, 27].

Table 3. Logistic regression: associations with Pap, HPV, and HPV–Pap co-testing recommendations

Predictor	HPV Test (N = 1882) OR (95% CI)	Pap Test (N = 1889) OR (95% CI)	Provider Recommendation for HPV–Pap Co-test (N = 1878) OR (95% CI)
Race/Ethnicity			
Black, NH vs White, NH	1.32 (0.74, 0.99)	0.48 (0.29, 0.78)*	0.98 (0.51, 0.70)*
Hispanic vs White, NH	1.29 (0.76, 0.99)	0.56 (0.36, 0.86)*	1.20 (0.68, 0.90)
Provider Status			
Yes vs No	2.33 (1.18, 1.66)*	4.59 (3.06, 6.89)*	2.73 (1.28, 1.87)*
Age Group			
21–30 vs 46+	2.64 (1.56, 2.03)*	0.15 (0.10, 0.24)*	3.66 (2.05, 2.74)*
31–45 vs 46+	3.55 (2.25, 2.83)*	0.57 (0.34, 0.95)*	4.05 (2.45, 3.15)*
Educational Attainment			
Bachelor's or higher vs <HS	2.17 (0.88, 1.38)	3.09 (1.50, 6.37)*	2.42 (0.89, 1.47)
High school graduate vs <HS	1.26 (0.51, 0.80)	1.16 (0.62, 2.17)	1.54 (0.56, 0.93)
Some college vs <HS	2.08 (0.86, 1.34)	1.71 (0.89, 3.28)	2.34 (0.87, 1.43)
Household Income			
≥$100k vs <$30k	1.95 (1.00, 1.4)	1.41 (0.66, 2.98)	2.48 (1.21, 1.73)*
$30k–<$60k vs <$30k	1.58 (0.92, 1.20)	0.88 (0.56, 1.37)	1.63 (0.90, 1.21)
$60k–<$100k vs <$30k	1.36 (0.75, 1.01)	0.64 (0.38, 1.09)	1.59 (0.82, 1.14)

*$p < 0.05$

Among women with a history of undergoing at least one Pap smear, Black and Hispanic women were more likely to have had a recent screening. Specifically, 82% of Black women (95% CI: 77%–86%) and 79% of Hispanic women (95% CI: 76%–85%) reported a Pap test within the last three years, compared to 73% of White women (95% CI: 69%–79%) **(Table 4).**

Table 4. Last Pap test less than three years ago

	Total (n = 1900)	
Variable	**Mean**	**(95% CI)**
All	0.76	(0.73,0.8)
White	0.74	(0.69,0.79)
Black	0.81	(0.77,0.86)
Hispanic	0.80	(0.76,0.85)

In comparison to the widespread acceptance and use of Pap smears, our study indicated that merely 37% of women had discussed the HPV test with their healthcare provider, and only 35% had undergone an HPV test at any point. These findings highlight that a substantial number of women are not undergoing HPV testing and are also not engaging in conversations with their providers regarding this key screening method.

Although Black and Hispanic women were less likely than White women to have ever received a Pap test, our logistic regression results on HPV test utilization **(Table 3)** showed no significant racial or ethnic differences in the likelihood of having had an HPV test among Black, Hispanic, and White women. Women with an established regular healthcare provider were more than twice as likely to have received an HPV test compared to those without one (OR = 2.33, CI = [1.18, 1.66]). Additionally, younger age groups showed higher rates of HPV testing than older women (21–30 vs. 46+: OR = 2.64 [CI = 1.56, 2.03]; 31–45 vs. 46+: OR = 3.55 [CI = 2.25, 2.83]).

Despite the low overall rate of women who had ever discussed the HPV test with a provider, an even smaller proportion—only 27% (CI = 25%, 29%)—reported receiving a recommendation from their provider for simultaneous Pap and HPV testing (co-testing). In contrast, our survey of physicians revealed that 96% considered the HPV–Pap co-test essential for routine screening. This discrepancy may indicate that, although providers support co-testing, they might not be effectively communicating this option to patients, or that some patients may not realize that a single sample can be used for both tests.

Regarding provider recommendations for HPV–Pap co-testing, descriptive data indicated comparable rates among White (29%, CI = 25%, 33%) and Hispanic women (26%, CI = 23%, 29%), whereas Black women reported significantly lower rates (22%, CI = 18%, 25%). After adjusting for covariates in logistic regression **(Table 3),** Black women remained less likely than White and Hispanic women to receive such recommendations. Women with a regular provider were more likely to be advised to undergo co-testing (OR = 2.73, CI = [1.28, 1.87]). Younger women had higher odds of receiving this recommendation compared to older ones (21–30 vs. 46+: OR = 3.66, CI = [2.05, 2.74]; 31–45 vs. 46+: OR = 4.05, CI = [2.45, 3.15]), and women in the highest income bracket ($100k+) were significantly more likely than those in the lowest (<$30k) to report such a recommendation (OR = 2.48, CI = [1.21, 1.73]).

The Pap test, introduced for cervical cancer screening in the early 20th century, identifies cervical cell abnormalities that could progress to cancer if untreated [4, 40]. The success of public health efforts promoting the Pap test is evident in the high lifetime uptake among women and the marked decline in cervical cancer incidence and mortality over recent decades. However, these gains have not been equitable across all groups [20-22]. Aligning with prior studies [23], our results show that, despite broader access to Pap testing, Black and Hispanic women remain less likely than White women to have ever undergone a Pap test or to have discussed it with a provider.

Notably, among those who had received a Pap test, Black and Hispanic women were more likely than White women to have had one within the past three years; nevertheless, they continue to face higher rates of late-stage cervical cancer diagnosis and mortality [17-19]. Although our data do not directly explain this paradox, existing research suggests potential factors: Lifetime Pap test receipt may not resolve ongoing barriers related to consistent care access. Black and Hispanic women are less likely to have a regular provider than White women [39], which can impede timely follow-up for abnormal results, such as colposcopy referrals; studies confirm lower follow-up rates for test results among Black and Hispanic patients [41]. Additionally, lower HPV vaccination coverage among Black and Hispanic women compared to White women may play a role [42], contributing to elevated cervical cancer risk.

Most prior research on cervical cancer prevention has centered on Pap testing, HPV vaccination, and related provider discussions, with limited attention to women's experiences with standalone HPV testing, co-testing, or conversations specifically about HPV tests. This study helps fill that void by examining women's engagement with HPV testing and co-testing alongside providers' views. We observed notably low involvement in HPV testing: although the majority of women had received a Pap test, fewer than half had ever had an HPV test or talked about it with their providers. The association of

HPV with sexual transmission (as an STI) could contribute to this pattern, potentially making women hesitant to broach the topic with providers, even though HPV is highly prevalent. Evidence also suggests that patients, including those at STI clinics, may not always know which specific tests are conducted [43]. Despite elevated cervical cancer incidence and mortality among Black and Hispanic women relative to White women [20-22, 24, 25, 44, 45], our analysis found no greater likelihood of lifetime HPV testing in these groups compared to White women.

The recent American Cancer Society guidelines favoring primary HPV testing stand in contrast to our provider survey, where only 18% of physicians viewed standalone HPV testing as sufficient for screening. This provider skepticism likely contributes to the overall low HPV test utilization across all women. The HPV DNA test was initially approved in 2011 for use with the Pap test, while primary HPV testing gained FDA approval much later, in 2020 [46]. Newer primary tests detect a broader range of HPV genotypes, including high-risk types 16 and 18 [47]. Some providers may hesitate to rely exclusively on HPV testing, given its role in guiding further steps like colposcopy or Pap follow-up based on genotype [46]. Moreover, since HPV is common, often clears without treatment—particularly lower-risk types—and lacks direct therapy, there are concerns about potential overtreatment [48]. Persistent high-risk HPV infections, however, remain the primary cause of cervical cancer and genital warts [49].

Regional differences may partly account for variations in patient screening practices, warranting further investigation. Additional studies should explore HPV testing and co-testing access across geographic scales—particularly in rural areas—and its relation to underserved communities. That said, 96% of providers endorsed the importance of HPV–Pap co-testing, which typically involves analyzing one sample for both HPV DNA and cellular changes. It is possible that providers are conducting co-tests without clearly informing patients. Future work should clarify whether low patient-reported HPV testing reflects limited access or misunderstanding, where women perceive co-tests solely as Pap tests rather than combined procedures.

Limitations

A key limitation of this research is its reliance on women's self-reported accounts of their healthcare interactions, which could be influenced by recall bias. Verifying these reports through medical records or claims data would enhance their reliability. Nevertheless, these self-reports capture women's own understandings of their encounters with various cervical cancer prevention methods and their experiences with providers, and such perceptions can significantly shape future health-seeking behaviors.

Although we assessed physicians' opinions on whether standalone HPV testing is sufficient for cervical cancer screening, we did not examine the frequency with which they actually order these tests for patients or discuss them during visits. Still, providers' attitudes are likely to influence their clinical decisions; if they doubt the adequacy of HPV testing alone, they may refrain from suggesting it. Given that our data include women's accounts of HPV test utilization and provider recommendations for such tests, the alignment between the low proportion of physicians endorsing standalone HPV testing and the low rates of women reporting HPV tests or related discussions supports the idea that provider beliefs may serve as an indicator of real-world practice.

Furthermore, although the study identifies ongoing disparities for Black and Hispanic women in Pap test uptake and receipt of recommendations for HPV–Pap co-testing, it did not encompass women from other racial/ethnic groups, including Asian American, Middle Eastern, and Native American populations. To gain a comprehensive view of how access to and provider conversations about cervical cancer prevention affect diverse groups, future research should incorporate broader samples that include women from these additional backgrounds.

Conclusion

As cervical cancer screening guidelines continue to evolve, additional studies are essential to assess the effects of these updates on screening experiences among Black, Hispanic, and White women, and to determine whether they contribute to further declines in cervical cancer incidence and mortality. Despite the availability of effective preventive measures—the Pap test, HPV vaccination, and HPV testing—Black and Hispanic women continue to experience disproportionately high rates of cervical cancer and related deaths. Accordingly, we urge public health professionals to sustain and intensify efforts to promote cervical cancer screening through multifaceted outreach channels, such as online platforms, social media, television, printed materials, and

radio, targeting all women but with particular emphasis on Black and Hispanic communities.

Acknowledgments: None

Conflict of Interest: None

Financial Support: None

Ethics Statement: None

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