2018

QUEER HEALTH EQUITY AND CERVICAL CANCER: IDENTIFYING SOCIAL DETERMINANTS OF PAPANICOLAOU TEST UPTAKE IN A SAMPLE OF SEXUAL MINORITY WOMEN AND GENDER NONBINARY INDIVIDUALS

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A dissertation submitted in partial fulfillment of the requirement for the degree of Doctor of Philosophy at Virginia Commonwealth University

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April, 2018

Acknowledgments

I would like to thank my mentor, Dr. Eric Benotsch, for his continued and indispensible guidance and support throughout my time as a doctoral student. I am also grateful for the presence and support of my dissertation committee, who have each been invaluable mentors throughout my doctoral studies: Drs. Paul Perrin, Kristina Hood, bee Coston, and Andrew Barnes. I would also like to thank the friends I have made in Richmond, VA, both inside and outside of my graduate program, as you have all truly been family, and I would never have come this far without your support. Finally, I am grateful for the support of my mother, Sharon Tabaac, whose sacrifices and determination throughout life have inspired my own. Thank you all for helping to make this dissertation possible.

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Abstract

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Sexual minority women (SMW) demonstrate lower rates of cervical cancer screening than heterosexual women. This is concerning as lesbian and bisexual women tend to engage in higher rates of substance-related cancer risk behaviors, unprotected sex, and tend to have higher body mass indices, all of which are risk factors for cancer development. Another major risk factor, screening avoidance, places SMW at increased risk for the development of high grade cervical lesions in the absence of early detection practices, which is likely to impact overall cervical cancer morbidity in this population. The aim of the present study was to utilize the Health Equity Promotion Model in order to investigate the interplay of medical heterosexism, social and community, behavioral, biological, and social identity/position factors on cervical cancer screening rates in a sample of SMW from a large metro area in the southeastern United States. 145 women who identify as sexual minorities were recruited from local LGBT-friendly

venues, events, community organizations, email LISTSERVs, and related social media accounts and were asked to complete a fifteen-minute survey.

A series of bivariate correlation, t-test, and multivariate regression analyses were run. Findings from mediation analyses demonstrated that health communication factors mediated the relationship between perceived medical heterosexism and cervical cancer screening outcomes. Further, after accounting for demographic factors, greater provider communication quality, provider trust, eHealth literacy, and ever having an HIV test significantly and differentially predicted cervical cancer screening outcomes in the multivariate models ($ps < .05$). Findings suggest that health communication factors play an important role in facilitating cervical cancer screenings for SMW, and provider training interventions and policy that focus on reducing medical heterosexism may aid in improving patient-provider relationships in this population.

Chapter 1: Cervical Cancer Screening in Sexual Minority Women

According to the American Cancer Society, women ages 21-65 should be screened by Papinocoleau (Pap) test once every three years (Saslow et al., 2012). Current research indicates that sexual minority women[1] (SMW) are not adhering to screening guidelines, which places them at greater risk of cervical cancer morbidity. Rates of screening compliance vary, and range between 62% (Tracy, Schluterman, & Greenberg, 2013) to 78.9% (Solazzo, Gorman, & Denney, 2017) in random probability samples of SMW. As the screening target in the U.S. is 93%, and the national screening average was 83% in 2010 (CDC, 2012), this demonstrates a worrying health disparity for SMW. Further, SMW consistently demonstrate lower odds of screening compared to heterosexual women across multiple studies (Charlton et al., 2011; Agénor, Muzny, Schick, Austin, & Potter, 2017; Lindley et al., 2009).

SMW also display higher rates of certain cancer risk factors that are likely to contribute to increased cervical cancer morbidity. Lesbians, when compared to heterosexual and bisexual women in national survey data, have higher odds of being overweight or obese (Boehmer, Bowen, & Bauer, 2011). In turn, obesity is associated with decreased cervical cancer screening in general populations of adult women (Maruthur, Bolen, Brancati, & Clark, 2009). Substance

[1] Within the present study, SMW refers to a broad category of individuals who are designated female at birth (DFAB) and exhibit attraction, either romantic, emotional, or sexual, to an array of gender identities beyond only cisgender men. As the broader literature does not distinguish between DFAB individuals who identify as women or as a nonbinary identity, the use of SMW within this review refers to individuals with either cisgender women or DFAB nonbinary identities. Though not included within the scope of this paper, transgender women can also fall under the categorical umbrella of sexual minority women. However, transgender women have different and unique health care needs. Similarly, though transgender men are DFAB and may share a medical need for cervical cancer screening dependent on their gender affirmation procedures and stage, extant literature points to unique barriers among transgender men relative to obstetric and gynecological care.

use behaviors are also higher among SMW, with rates of alcohol abuse history (12.4%) and current cigarette smoking (21.2%) exceeding national averages for adult U.S. women (Cochran et al., 2001) Additionally, previous research has demonstrated that SMW have higher odds of engaging in substance use (Mereish & Bradford, 2014; Rosario et al., 2016) and higher dietary and physical activity cancer risk factors (Rosario et al., 2016) than heterosexual women. Lesbian women are also less likely to use sexually transmitted infection (STI) testing services (Agénor, Krieger, Austin, Haneuse, & Gottlieb, 2014a; Douglas, Deacon, & Mooney-Somers, 2015) and have low rates of receiving/completing the HPV vaccination series (McRee, Katz, Paskett, & Reiter, 2014; Reiter & McRee, 2015). SMW also experience a multitude of sexual and reproductive health risks that can contribute to the contraction of high-risk HPV: in a secondary data analysis of the National Survey of Family Growth, both lesbian and bisexual women reported a younger age of heterosexual sexual debut, a higher number of sexual partners (both men and women), and higher rates of forced intercourse compared to heterosexual women (Tornello, Riskind, & Patterson, 2014).

According to the Centers for Disease Control and Prevention, over 30,700 new cases of HPV-associated cancer are diagnosed each year (CDC, 2016). Higher rates of sexual health risk behaviors combined with lack of routine sexual health screening place SMW at risk for the contraction of human papillomavirus (HPV) infections that contribute to the development of high-grade cervical neoplasia. Without Pap testing, the risk of these neoplasia developing into late stage cervical cancer increases. In a secondary analysis of the 2003-2012 National Health and Nutrition Examination Survey, Reiter and McRee (2016) found that high-risk HPV infections are common among SMW, with bisexual women having the greatest odds of HPV infection compared to both lesbian and heterosexual women.

Cumulatively, these data indicate SMW may face increased disease burden. However, lack of sexual orientation items in national cancer surveillance systems prevents definitive knowledge of cervical cancer incidence in populations of SMW (Bowen & Boehmer, 2007; Massetti, Ragan, Thomas, & Ryerson, 2015). So far, findings from two recent studies of cancer morbidity suggest SMW may face an increased burden for cervical and breast cancers (Boehmer, Miao, & Ozonoff, 2011, Boehmer, Ozonoff, & Timm 2010), and an exploratory meta-analysis (Robinson, Galloway, Bewley, & Meads, 2016) found that bisexual women have significantly higher rates of cervical cancer than heterosexual women (2.1% bisexual vs. 1.3% heterosexual, Valanis et al., 2000). In a study of the adult U.S. cancer population, bisexual women had significantly higher rates of cervical cancer compared to heterosexual women in the sample (41% in bisexual women vs. 14% in heterosexual women; Boehmer, Miao, & Ozonoff, 2011). Given these preliminary epidemiological findings, combined with overall risks behaviors, it is critical for public health research to consider the contexts and communication factors that influence Pap test uptake in SMW populations.

Chapter 2: Medical Heterosexism and Cervical Cancer Screening

Medical heterosexism refers to heteronormativity experienced within the health care system. Heterosexism often manifests in patient-provider interactions. Qualitative research on medical heterosexism among SMW has documented multiple ways it can occur. In a study of heterosexism and cancer care among lesbians (Sinding, Barnoff, & Grassau, 2004), participants described dynamics with providers changing after sexual orientation disclosure; nurses displayed discomfort, physicians made discriminatory remarks about women due to their sexual orientation, and in more extreme cases, denied care due to discomfort or lack of knowledge of Pap testing procedures for SMW (which is alarming, as standards of care do not change based on a patient's sexual orientation; Saslow et al., 2012). Further, physicians assumed heterosexuality of patients, and in cases of disclosure, ignored patients' sexual orientation and persisted in references of heterosexuality (e.g., referring to men as partners or husbands that did not exist). As a result of these experiences, SMW developed strategies for the "early detection" of sexual orientation-based discrimination in cancer care. Interviewees in this study came from a range of regions, including rural, urban, and semi-urban, races, and ethnicities, which suggests heterosexism is pervasive in multiple contexts and is likely to be further complicated by such intersectional factors.

Efforts to combat heterosexism in health care environments can promote sexual health care usage. Such practices include having affirmative information about sexual and gender minority (SGM) health in waiting areas, forms or patient interviews that inquire about sexual orientation, and discussions of confidentiality surrounding sexual orientation information (St. Pierre, 2012). Further, presence of these factors is typically associated with sexual orientation

disclosure to providers (St. Pierre, 2012). Additionally, a qualitative study of lesbian women's health care preferences identified misinformation about gynecological cancer risk from providers as a health information barrier (Seaver, Freund, Wright, Tjia, & Frayne, 2008).

The majority of research conducted on heterosexism, homophobic discrimination, and cervical cancer screening in SMW is limited to qualitative investigations. To date, three studies have utilized a quantitative framework (Tracy, Lydecker, & Ireland, 2010; Tracy, Schluterman, & Greenberg, 2013; Johnson, Mueller, Eliason, Stuart, & Nemeth, 2016), and of these, only two directly measured heterosexism and/or discrimination from providers (Johnson, Mueller, Eliason, Stuart, & Nemeth, 2016; Tracy, Lydecker, & Ireland, 2010). In one study of SMW in the U.S., Tracy and colleagues (2013) examined daily and lifetime experiences of discrimination and routine cervical cancer screening rates. Daily and lifetime discrimination were not associated with screening in either study's multivariate models, though these operationalizations are not directly comparable to the construct of healthcare discrimination and are not necessarily contrary to other studies' findings. An earlier study by Tracy, Lydecker, and Ireland (2010) did find that nonroutine screeners perceived significantly more general discrimination in healthcare settings than routine screeners, though this item did not specifically assess discrimination due to sexual orientation. However, in the same study, avoiding care due to fears of discrimination based on sexual orientation was also associated with decreased likelihood of routine screening at the bivariate level. Further, a recent study by Johnson, Mueller, Eliason, Stuart, & Nemeth (2016) found that health care environments that were welcoming for SMW and their partners increased the odds of routine Pap testing. Conversely, perceived discrimination from providers based on sexual orientation and/or butch gender expression lowered odds of routine screening.

Qualitative work on cervical cancer screening and heterosexism is more prevalent. In a study of lesbians in Australia, participants described providers giving incorrect information about cervical cancer risk due to lack of sexual contact with cisgender men (Curmi, Salamonson, & Peters, 2014). Heterosexism can also manifest as the incorrect assumptions health care providers have about women's sexuality and SGM sexual health risks. Another study by Curmi, Salamonson, and Peters (2016) found that themes of heterosexism in cervical cancer screening contexts are similar to those described by Sinding, Barnoff, and Grassau (2003): SMW described providers assuming patient heterosexuality, providers becoming uncomfortable when sexual orientation was disclosed, or failing to acknowledge patient sexual orientation entirely. A mixed methods U.K. study by Darwin and Campbell (2009) echoes themes about fear of disclosure due to anticipated provider heterosexism, and Power, McNair, and Carr's (2009) study in Melbourne, Australia also had themes pertaining to providers' misinformation about lesbian sexual health risks. Further, Power and colleagues identified themes of heterosexism in health information contexts as well: brochures about lesbian sex were often vague about the acts being described, while others did not specify sexual orientation and instead gave information on "all women." A recent U.S. study by Johnson and colleagues (2016) echoes the importance of safe and affirming environments for SMW health: participants who experienced welcoming practice environments felt more comfortable receiving cervical cancer screening services. One study focused on older adult SMW (McIntyre, Szewchuk, & Munro, 2010), and similarly found that SMW often had to advocate for their own sexual health, as providers did not always recommend Pap testing due to patients' sexual history.

There may be limitations to the generalizability of these studies, as only one had a sample of non-White SMW (Agénor, Bailey, Krieger, Austin, & Gottlieb, 2015). Agénor and colleagues

conducted focus groups with Black SMW in the Boston and Cambridge metro areas. Like Sinding, Barnoff, & Grassau's (2004) study of heterosexism in cancer contexts, Black SMW reported feeling wary of disclosing their sexual orientation due to fears of discrimination or decreased quality of their patient-provider relationship. Further, Black SMW also described provider discomfort during Pap tests and providers ignoring sexual orientation upon disclosure. For Black SMW unconcerned about potential heterosexism, anticipated racism still played a role in patient-provider encounters. Many participants described providers making assumptions about their socioeconomic status based on their race, which could manifest as providers "talking down" to patients. Thus, for Black SMW, heterosexism and racism are likely to interact and affect cervical cancer screening experiences.

Themes of heterosexism also appear in studies of provider competency. A U.S.-based study of providers, including obstetricians/gynecologists, found that many physicians did not regularly discuss sexual orientation or attraction when taking a sexual history of adolescents, often deeming it to be a nonsignificant part of care (Kitts, 2010). Another study of oncologists demonstrated low rates of inquiry about patient sexuality and gaps in knowledge of SGM health needs (Shetty et al., 2016). Similar studies of general practitioners have shown that providers tend to be unaware of the sexual orientation of their patients (Stott, 2013) and feel unprepared or uncomfortable communicating about sexual health needs. Given that general practitioners often refer patients to obstetrician/gynecologists for Pap testing, low cultural competency of general practitioners presents another barrier to cervical cancer screening in SMW.

Additionally, provider attitudes toward SGM in the U.S. are not always positive. Sabin, Riskind, and Nosek (2015) found that many heterosexual providers hold implicit preferences for heterosexual patients over gay and lesbian patients, and this finding was observed in both male

and female providers and nurses. Heterosexual providers and nurses also displayed explicit preferences for heterosexual patients. A systematic review of nursing attitudes similarly found a wide range of very negative to positive attitudes within the literature (Dorsen, 2012). Given desirability bias can play a role in influencing participant endorsement of explicit attitude measures, the existence of multiple studies with negative attitudinal findings exhibits the pervasiveness of heterosexism. Further, patients are often aware of these negative attitudes, as is evidenced by the multiple qualitative studies documenting patients' perceptions of provider discomfort after sexual orientation disclosure (Curmi, Peters, & Salamonson, 2016; Sinding, Barnoff, & Grassau, 2003; Agénor, Bailey, Krieger, Austin, & Gottlieb, 2015).

Overall, research on medical heterosexism demonstrates gaps in providers' cultural competence with SMW in cervical cancer contexts. Thus, research that seeks to take a health equity approach must consider how manifestations of heterosexism influence the cervical cancer screening behaviors and experiences of SMW. Additionally, such an approach should examine strength-based factors that assist SMW in navigating a potentially heterosexist medical environment in order to get screened or obtain relevant and trustworthy information about sexual health risks.

Chapter 3: The Health Equity Promotion Model

Equity is an important consideration in the context of health communication research. A majority of the literature on SMW cervical cancer screening has operated from a deficit perspective, which is characterized by a focus on health disparities and related risk factors (Schiavo, 2011). Though this approach is invaluable in ascertaining rates of disease and health behaviors based on certain sociodemographic and risk factors, it is limited in offering solutions to existing disparities that stem from systemic marginalization. Thus, other approaches are needed that explore the interplay of systemic marginalization (i.e., medical heterosexism) and other social determinants of health on Pap test uptake in SMW. In particular, health equity factors that can inform health care training, messaging, and policy for cervical cancer prevention in SMW need to be identified. Further, not all SMW exhibit low rates of cervical cancer screening—in some studies, there are no differences between heterosexual women and SMW in rates of barriers experienced or routine cervical cancer screening (Clark et al., 2009), and in others, there are still high percentages of SMW who are regular screeners (e.g., Matthews et al., 2013, Tracy, Schluterman, & Greenberg, 2013, Johnson, Mueller, Eliason, Stuart, & Nemeth, 2016; Matthews et al., 2013; Solazzo, Gorman, & Denney, 2017). Thus, it is equally important to study factors that contribute to "good health [behaviors] in the face of adversity," (Fredriksen-Goldsen et al., 2014, pp.655).

An important direction in SMW cancer prevention research includes not only identifying barriers to screening, but also the ways in which regular screeners become regular screeners in the first place. In other words, it is important to identify SMW-specific facilitators of cervical cancer screening that either directly increase the probability of screening or mediate the

influence of barriers. One framework that fits this function is the Health Equity Promotion Model (Fredriksen-Godsen et al., 2014), which was designed for use specifically with SGM populations. The Health Equity Promotion Model is an extension of Minority Stress Theory and Psychological Mediation Framework, and it focuses on how SGM health is influenced by social positions (e.g., age, race/ethnicity, gender identity, sexual orientation), individual, structural, and environmental context (e.g., perceptions of heterosexism and discrimination), and how these contexts intersect with health-promoting and adverse pathways (i.e., biopsychosocial pathways of health) to influence health outcomes or behaviors. Further, this model stipulates that these factors change across the life course.

Social Identities and Positions

Social identities and positions concern the ways in which personal identities interact with systems (i.e. health care) to influence health outcomes. Pap testing can differ by sexual identity and behavior. For instance, though rates of screening are lower in bisexual and lesbian women than in heterosexual women (Agénor, Krieger, Austin, Haneuse, & Gottlieb; Charlton et al., 2011; Douglas, Deacon, & Mooney-Somers, 2015; Buchmueller & Carpenter, 2010), this disparity has been explained in one study by SES-specific variables like income, education, and employment status (Solazzo, Gorman, & Denney, 2017). In the same study, these predictors were not significant for lesbian women in the sample. Experiences of heterosexism can also differ by gender expression. Hiestand, Horne, & Levitt (2007) found that butch women (i.e., SMW with masculine gender expressions) had fewer routine gynecological exams than femme women (i.e., SMW with feminine gender expressions). Further, butch SMW perceived poorer treatment from providers and greater difficulty in locating SGM-affirming providers.

Race and ethnicity. Race is another domain that interacts with sexual orientation. Limited research has demonstrated differences in rates of screening and the associations between particular facilitators among different racial groups. Matthews and colleagues (2013) found that in a Chicago sample of African American SMW, traditional correlates of on-time cervical cancer screening (operationalized as past year Pap testing based on 2009 guidelines), including provider recommendation, age, and insurance status, were not significantly associated with past-year screening in their model, despite the lower-than-average rates of past-year screening (68.2%). This finding is congruent with a study by Agénor, Krieger, Austin, Hanuese, & Gottlieb (2014b), which found that among White, Latina, and Black racial groups, receipt of sexual and reproductive health services, which is often an indicator of provider referral for Pap testing, and being insured only increased Pap test odds for White SMW. Thus, it is likely that race differentially interacts with other facilitators and barriers of cervical cancer screening, particularly those related to healthcare utilization.

Age. Age is a potential confound and tends to exhibit a curvilinear relationship with Pap testing in samples of SMW, with rates of testing increasing with age and tapering off after the mid-30s (Solazzo, Gorman, & Denney, 2017). Previous research has also demonstrated that older women are more likely to be routine screeners compared to younger women (Clark et al., 2009; Ben-Natan & Adir, 2009; Douglas et al., 2015; Solazzo, Gorman, & Denney, 2017). One past study has found that sexual orientation, when operationalized as partner gender (or desired gender of a future partner), is not significantly associated with on-time cervical cancer screening and does not interact with number of perceived barriers to screening (Clark et al., 2009). However, given the study's sample only includes women ages 40-75, it is likely that these findings are not generalizable to women under 40 who are less likely to screen (Ben-Natan &

Adir, 2009). Generational differences may also come into play, as mid-life lesbians reached sexual maturity in an era where "coming out" was unsafe, and relevant sexual health resources were nonexistent (McIntyre, Szewchuk, & Munro, 2010). Further, older age has been identified as a factor connected to assertiveness in patient-provider encounters (McIntyre, Szewchuk, & Munro), which may be indicative of patient-provider skillsets differing among age cohorts.

Multi-level Context

***Heterosexism and discrimination*.** Structural, environmental, and social barriers are theoretically important predictors of Pap test utilization for SMW. Given reports of perceived discrimination from SMW about their clinical encounters with providers (e.g., Curmi, Peters, & Salamonson, 2016; Johnson, Nemeth, Mueller, Eliason, & Stuart, 2016), it follows that such negative experiences discourage health care utilization and reduce opportunities for Pap testing recommendations and procedures to occur. Qualitative studies of SMW have discussed themes of provider competency, provider sensitivity to sexual orientation disclosure, and perceptions of feeling safe and welcome as important for regular screening behaviors (Johnson, Nemeth, Mueller, Eliason, & Stuart, 2016, Johnson, Mueller, Eliason, Stuart, & Nemeth, 2016, Agénor, Bailey, Krieger, Austin, & Gottlieb, 2015). Others have found that SMW with low cervical cancer risk perceptions were given inaccurate information about HPV and cancer risk by health care practitioners (Curmi, Peters, & Salamonson, 2014). To date, one quantitative study has examined aspects of medical heterosexism in studies of cervical cancer screening in SMW. Johnson, Mueller, Eliason, Stuart, & Nemeth (2016) included components of heterosexism (patient rights statements about sexual orientation, written forms including information about sexual orientation, staff asking about sexuality and partner status, partner welcomed at visits, provider reputation in LGBT community), of which welcoming healthcare environments and

partners being welcomed were significantly associated with routine rate of screening. Further research is necessary to replicate this finding in other regions (beyond the U.S. southwest) and to examine other aspects of the construct, including misinformation about cervical cancer risk or perceived consequences of sexual orientation disclosure (i.e., an alteration in patient-provider communication dynamics or treatment). There has been research on SMW and the relationships among perceived heterosexism from providers, use of gynecology exams, and health beliefs about breast health (DeHart, 2008). In a sample of exclusively homosexual women, perceived heterosexism and homophobia from providers were associated with the degree of patient-provider communication that occurred, frequency of service use (including gynecological services), and quality of care received. This finding likely translates to cervical cancer prevention contexts, which suggests heterosexism plays an important role in the ways SMW discuss gynecological health care needs and the subsequent Pap testing services they receive.

It is important to note that though heterosexism includes experiences of stigma and discrimination, it also involves subjective perceptions of structural stigma – that is, provider and/or practice behaviors and communication that do not necessarily occur out of malice but due to misinformation or absence of training with SGM populations. In other words, homophobic discrimination is an interpersonal construct engendered from larger, macro-level heterosexist systems (i.e., the U.S. healthcare system, from which providers are trained and socialized), but other interpersonal forms of heterosexism can also be experienced. More direct discrimination has been less studied using quantitative methodology: of the three studies that did assess past discrimination in relation to Pap testing (Tracy, Lydecker, & Ireland, 2010; Tracy, Schluterman, & Greenberg, 2013; Johnson, Mueller, Eliason, Stuart, & Nemeth, 2016), only two looked at whether or not an individual felt discriminated against in health care settings (Tracy, Lydecker,

& Ireland, 2010; Johnson, Mueller, Eliason, Stuart, & Nemeth, 2016). Tracy, Lydecker, and Ireland (2010) found that SMW who were nonroutine cervical cancer screeners were more likely to have perceived greater discrimination in various medical settings and to avoid care due to concerns of future discrimination. In another study by Johnson, Mueller, Eliason, Stuart, & Nemeth (2016), perceived discrimination based on gender expression and on sexual orientation were both significant predictors of lower odds of routine screening in a sample of cisgender SMW and transgender men. Within both studies, discrimination was specifically operationalized as occurring in the context of medical encounters.

As previously discussed, the majority of studies that identify a link between past experiences of discrimination and current screening practices are qualitative in nature (e.g., Powers, McNair, & Carr, 2009; Darwin & Campbell, 2009; Curmi, Peters, & Salamonson, 2016) and future research should seek to replicate the association identified by Johnson, Mueller, Eliason, Stuart, & Nemeth (2016). The paucity of quantitative findings on heterosexism, discrimination, and cervical cancer screening indicates that strategies SMW undertake to circumvent provider heterosexism or address it in cervical cancer prevention contexts have not been empirically linked.

Health-Promoting and Adverse Pathways

Health information seeking behaviors (HISB). Over 72% of American Internet users have searched for health information online, 75% reported the information found online impacted their health decisions, and 53% reported speaking to a doctor about the information found (Fox and Duggan, 2013). Internet health information seeking has been theorized to be an important strategy for reducing health disparities in minority populations (Hong, 2008). A mixed methods study conducted by Magee, Bigelow, DeHaan, and Mustanski (2012) on Internet sexual

health information seeking behaviors in SGM young adults (age 16-24) found that use of the Internet to search for sexual health information was common among participants (75%). Magee and colleagues (2012) also found that the Internet was used to locate information pertaining to both sexual health and agencies that could provide sexual and reproductive health services. Within the general U.S. population, health information seeking has been associated with increased patient-instigated communication with providers and referral for medical procedures (Wiltshire, Cronin, Sarto, & Brown, 2006). Whether this association exists for SMW in cervical cancer screening contexts is important to determine, as skills that facilitate screening for SMW who encounter providers with inadequate knowledge about their cervical cancer risk status are relatively unknown.

Further, cancer-related Internet usage has been associated with improved patient-provider communication self-efficacy among newly-diagnosed cancer patients in the U.S. (Bass et al., 2006), as well as increased likelihood of regular cervical cancer screening in a general population of women (Shneyderman et al., 2016). Additionally, Internet health information seeking has been associated with cervical cancer screening adherence in women age 36-50 and 51-65 (Shneyderman et al., 2015). This study utilized secondary data from the Health Information National Trends Survey that was originally collected in 2003 and 2007. As sexual orientation data were not collected, these findings are not immediately generalizable to populations of SMW who may have different reasons for searching for online health information at younger ages. However, results indicate that a connection generally exists between Internet health information seeking and cervical cancer screening adherence rates. To date, only one study on cervical cancer screening in SMW examined rates of Internet health information seeking in SMW. Ben-Natan and Adir (2009) found that 43.5% of Israeli lesbian women in their

study sample had not received information about Pap tests, and of those who did, 12.9% received their information from the Internet (compared to 15.9% from providers and 25.9% from friends/relatives); however, this study did not assess whether information source correlated with any type of perceived barrier, benefit, susceptibility, knowledge, or other cervical cancer-related factor.

Though there has not been a correlational investigation of any form of health information seeking in populations of SMW, qualitative research of SGM adults has shown the Internet to be an important tool for finding information and connecting SGM adults with community resources and networking opportunities (Mehra, Merkel, & Bishop, 2004). A recent qualitative study by Flanders, Pragg, Dobinson, and Logie (2017) found that young adult SMW preferred using online sources, ranging from apps, websites, blogs, and YouTube, to search for sexual health information over provider resources due to reasons of accessibility in addition to experiences or fears of heterosexism from providers. Additionally, a quantitative content analysis of online lesbian health queries through "Ask the Doctor" web services found that a majority of queries pertained to sexual and gynecological health, in addition to searches for culturally competent health care services (Polonijo & Hollister, 2011). Similar to the Flanders, Pragg, Dobinson, & Logie (2017) study, heterosexist health care encounters were cited as reasons for online searches. Thus, it is likely that past experiences of provider heterosexism are directly related to the health information needs and practices of SMW.

Limited qualitative research also exists on SMW and use of the Internet for cervical cancer-related health information seeking. In their study of older adult SMW, McIntyre, Szewchuk, & Munro (2014) found that mid-life lesbians reported actively using the Internet to find pertinent sexual health information (McIntyre, Szewchuk, & Munro). Curmi, Peters, and

Salamonson (2016) found that participants had difficulty using health information brochures in doctors' offices and other forms of print information, as most did not contain lesbian-specific information. However, given the presence of misinformation and misperceptions of SMW's cervical cancer risk (i.e., the belief that without penetrative sexual activity with cisgender men, a cisgender woman is not at risk for HPV or cervical cancer) from providers (e.g., Curmi, Peters, & Salamonson, 2014; Power, McNair, & Carr, 2009), Internet health information seeking likely plays a role in patient self-advocacy.

Importantly, though information related to cervical cancer risk of SMW is available on the Internet, these sources vary in quality (Lindley, Friedman, & Struble, 2012; Faulkner & Lannutti, 2016) and high rates of spurious results occur in Internet sexual health information searches (like pornography; Smith et al., 2000). In a content analysis of twenty-five websites containing lesbian sexual health information, Lindley, Friedman, and Struble (2012) found that only one third (36%) of the websites contained information on cervical cancer, 44% recommended that lesbians should obtain Pap tests, and a mere 4% contained recommendations about receiving the HPV vaccination. Further, on average, these websites received Flesch Reading Scale scores that indicated difficult readability. In a different qualitative content analysis of online sexual health resources for lesbian and bisexual women, both text- and video-based sources were assessed (Faulkner & Lanutti, 2016). Of the forty-six unique text-based resource links and sixty-three unique video links analyzed in the study, the majority was not comprehensive. The majority of the text-based search options were scholarly journal articles targeted toward providers. Fact sheets and question and answer forms were also prevalent (and included topics related to cervical cancer), though few discussed issues related to identity (which was more prevalent in videos recorded by actual lesbian and bisexual women).

These findings indicate that cervical cancer screening information that specifically targets lesbian health is not readily available, easily interpretable, or comprehensive in topics or perspectives covered. This lack of credible or easily attainable sexual health information targeted toward SMW indicates that skill in navigating and interpreting online health information, or eHealth literacy, may be important for SMW to obtain accurate messages about cervical cancer risk and information about SMW-friendly healthcare providers. Given the lack of data on how SMW use the Internet to search for cervical cancer information, and whether this behavior further influences patient-provider relationships of SMW, its inclusion in the present study will provide novel information. Given these findings, eHealth literacy is likely an important skillset for SMW and a correlate of cervical cancer screening.

eHealth literacy. eHealth literacy involves an individual's ability to find, interpret, and apply health information found online (i.e., eHealth information; Norman & Skinner, 2006). eHealth literacy is a skill that is directly related to health-related Internet usage, and it is associated with increased likelihood of searching for health information online and using more online sources of higher quality (Neter & Brainin, 2012; Chen et al., 2014; Li, Orrange, Kravitz, & Bell, 2014). In a study of the general population, Li, Orrange, Kravitz, & Bell (2014) found that patients who seek online health information after doctors' visits were more likely to be eHealth literate and were able to use more advanced sources of health information, like online medical journals, authoritative health websites, and/or medical association websites.

Since health information seeking is also associated with patient-provider communication factors (Wiltshire, Cronin, Sarto, & Brown, 2006; Bass et al., 2006) and overall health status (Park, Cormier, Gordon, & Baeg, 2016), it can indirectly influence acquisition of provider recommendation for cervical cancer screenings and is likely to influence health beliefs. Given

the mixed quality and advanced writing level of many online health information sources available to SMW (Lindley, Friedman, & Struble, 2012), eHealth literacy is likely to play a major role in how SMW initiate health-related Internet usage and their ability to interpret and apply knowledge from online sources. To date, increased eHealth literacy has been associated with a greater likelihood of undergoing colorectal cancer screening (Mitsusake, Shibata, Ishii, & Oka, 2012), but it has not yet been examined in populations of SMW.

eHealth literacy is also important when considering the limited connection between knowledge of cervical cancer and routine screening. Research on SMW from both convenience (Tracy, Lydecker, & Ireland, 2010) and simple random samples (Tracy, Schluterman, & Greenberg, 2013) report null findings regarding the association between knowledge and screening. In the latter study (Tracy, Schluterman, & Greenberg, 2013), the only knowledge indicator that predicted routine screening outcomes was the knowledge that not screening regularly puts individuals at higher risk for the development of cervical cancer. Since SMW have reported that print sexual health resources that discuss cervical cancer risk do not specifically discuss SMW's susceptibility to cancer-causing strains of HPV (Curmi, Peters, & Salamonson, 2014), it is likely that SMW can be knowledgeable about cervical cancer while also holding incorrect beliefs about their own susceptibility. When taken in conjunction with reported misinformation given by providers (Curmi, Peters, & Salamonson, 2016; Darwin & Campbell, 2009; Power, McNair, & Carr, 2009; Johnson, Nemeth, Mueller, Eliason, & Stuart, 2016) and the mixed quality of online health sources (Lindley, Friedman, & Struble, 2012; Faulkner & Lannutti, 2016), eHealth literacy may be a necessary skill for finding accurate sexual health information that is specific to SMW. Additionally, eHealth literacy may be a useful tool in locating healthcare resources that are deemed SMW-friendly.

Patient-provider communication. Patient-provider communication is an integral part of health care decision-making, and has been associated with greater likelihood of cervical cancer screening in studies of the general population (Politi, Clark, Rogers, McGarry, & Sciamanna, 2008; Peterson et al., 2016). Since provider recommendation is a robust predictor of cervical cancer screening uptake in SMW (Tracy, Schluterman, & Greenberg, 2013; Johnson, Mueller, Eliason, Stuart, & Nemeth, 2016), better communication between SMW and their providers is likely to be necessary for increased rates of screening. Perceived heterosexism has previously been reported by SMW as negatively influencing communication quality with providers in breast cancer contexts (DeHart, 2008), which illustrates another barrier to obtaining recommendation. Another aspect of patient-provider communication, the disclosure of sexual orientation to providers, has been previously associated with increased preventive care usage (St. Pierre, 2012) and cervical cancer screening (Tracy, Schluterman, & Greenberg, 2013; Johnson, Mueller, Eliason, Stuart, & Nemeth, 2016; Douglas, Deacon, & Mooney-Somers, 2015) in SMW.

Additionally, Internet health information seeking can play a role in the improvement of patient-provider relationships and communication (Wiltshire, Cronin, Sarto, & Brown, 2006; Bass et al., 2006), and can also act as a tool to supplement unsatisfactory patient-provider interactions (Li, Orrange, Kravitz, & Bell, 2014). In a study of the general population, Li, Orrange, Kravitz, & Bell (2014) found that many patients who searched for Internet health information following doctors' appointments did so due to unsatisfactory doctor performance. Given the pervasive nature of heterosexism in patient-provider interactions and reported dissatisfaction or concern with healthcare encounters (e.g., Johnson, Nemeth, Mueller, Eliason, & Stuart, 2016; Curmi, Peters, & Salamonson, 2016; Agénor, Bailey, Krieger, Austin, & Gottlieb, 2015), it is likely that SMW use the Internet for similar reasons, and that it has the

potential to influence future patient-provider interactions. Additionally, a nationally representative study of women age 45 to 64 found that both Non-Hispanic White and Hispanic women who searched for online health information were more likely to relay this information to providers. This study illustrates that online health information can be used for patient self-advocacy, which is likely to be an important skill for SMW who may be given inaccurate sexual health risk information. McIntyre, Szewchuk, & Monroe (2010) had similar findings in a study of older adult SMW and cervical cancer screening where themes of assertiveness and self-advocacy informed by active health information seeking emerged. Another study of newly diagnosed cancer patients in the general U.S. population found that Internet use predicted better patient-provider relationships and treatment compliance (Bass et al., 2006). Finally, a recent systematic review of patient-provider communication and cancer screenings in the general population cements the importance of patient provider communication, as cumulative empirical evidence points to the quality of patient-provider discussions surrounding screening influences whether patients act on cancer screening recommendations (Peterson et al., 2016). Cumulatively, evidence from correlational studies of the general adult populations suggests relationships among Internet health information seeking behaviors, patient-provider communication factors, and attainment of cancer screening recommendations. Health communications constructs related to patient-provider interactions and communication quality have not been empirically examined using quantitative methodological frameworks in populations of SMW beyond studies of sexual orientation disclosure.

Patient-provider communication quality may also interact with sexual orientation disclosure. Douglas, Deacon, & Mooney-Somers (2015) found that SMW who had regular providers they were "out" to were 2.5 times more likely to have ever had a Pap test, in contrast

with women who had a regular provider they were not "out" to; women who merely had a regular provider only were 1.5 times more likely to have ever had a Pap test. Similarly, Mosack, Mosack, Brouwer, and Petroll (2013) found that SMW who were "out" to providers had greater satisfaction with the care they received in addition to greater comfort discussing their sexual health needs. Another study of mid-life lesbians found that older lesbian women tended to be assertive in their healthcare encounters, often challenging instances of provider heterosexism in the form of medical misinformation pertaining to screening practices (McIntyre, Szewchuk, & Munro, 2010). In line with these findings, an Israeli study found that lesbian and bisexual women who disclosed their sexual orientation to their providers were more likely to have ever had a Pap test (Mor et al., 2015). This indicates that quality of provider relationships is important to screening outcomes, and knowledge of participant sexual identity is a facilitating component of that process; alternatively, patients may be more likely to be out to more culturally competent providers. However, there may be some risk associated with disclosure, as two other qualitative studies have identified disclosure as a risk factor for receiving inaccurate information about cervical cancer risks from providers (McIntyre, Szewchuk, & Munro, 2010; Curmi, Peters, & Salamonson, 2014).

A final construct that relates to patient-provider communication is trust. Patient-provider trust involves the relationship quality between patients and their providers. A recent systematic review of patient-provider communication in cancer screening contexts describes patient-provider interaction communication as a nuanced process (Peterson et al., 2016). Though provider recommendation is consistently associated with screening adherence, it does not fully explain screening patterns in the general population (Peterson et al., 2016). Trust in physicians may also help explain disparities in minority populations. Within the health communication

literature, a health knowledge approach involves the assumption that sources of health information, health procedures, or health results are trustworthy entities and should be related to health service usage. Given the lack of relationship between cervical cancer knowledge and screening behavior across several studies (Tracy, Lydecker, & Ireland, 2010; Tracy, Schluterman, & Greenberg, 2013; Douglas, Deacon, & Mooney-Somers, 2015), it is likely that factors related to trust in health care systems (its sources, and by proxy, its professionals) influence screening. Factor, Kawachi, & Williams (2011) theorizes that the medical establishment often represents "untrustworthy entities." Given the role of heterosexist healthcare experiences in predicting lower Pap testing likelihood (Johnson, Mueller, Eliason, Stuart, & Nemeth, 2016), distrust in in providers may also act as another barrier to screening. This may also partially explain the discrepancy in healthcare facilitators between African American/Black and White/Caucasian SMW across studies (Agénor, Krieger, Austin, Haneuse, & Gottlieb, 2014b; Matthews et al., 2013), including the lower probability of Black women who engage in health information seeking of using obtained information for self-advocacy in patient-provider encounters (Wiltshire, Cronin, Sarto, & Brown, 2006). If heterosexism, a systemic construct, precipitates a distrust in physicians who are part of a heterosexist medical system or have personally acted in heterosexist and racist manners, the double jeopardy of heterosexism and racism experienced by African American/Black SMW may indicate a greater likelihood of distrust toward U.S. health care providers. Thus, an individual may understand health risks, but may not trust providers to accurately, safely, or sensitively screen for cervical cancer (Johnson, Nemeth, Mueller, Eliason, & Stuart, 2016).

Sexual and reproductive health service usage. Sexual and reproductive health (SRH) service usage (i.e., contraception usage and/or STI testing) has also been shown to increase the

likelihood of obtaining a Pap test for bisexual women (Agénor, Krieger, Austin, Hanuese, & Gottlieb, 2014a) and for combined samples of SMW (Douglas, Deacon, & Mooney-Somers, 2015; Charlton et al., 2014). This is a likely avenue for some SMW to obtain referral for other sexual health services like Pap testing; though it has several limitations. STI testing tends to be underutilized by both lesbian and bisexual women, regardless of sexual activity (Douglas, Deacon, & Mooney-Somers, 2015), and hormonal contraceptive use is not frequently used in lesbian samples (Charlton et al., 2014). In another study, SRH usage fully explained disparate odds of screening between women with female-only partners and those with male-only partners (Agénor, Krieger, Austin, Hanuese, & Gottlieb, 2014b). However, this particular pattern was only significant for White SMW and not Black or Latina SMW (Agénor et al., 2014b). Agénor and colleagues (2014b) theorized that utilization of community health resources and enrollment in public health insurance programs (e.g., Medicaid) for Black and Latina women may partially explain this finding since white women are more likely to utilize private practitioners or private health care plans with cost-sharing mechanisms for health care needs (Kaiser Family Foundation, 2015). Thus, receipt of SRH services from private practitioners and insurance plans may be less important for Pap receipt or referral in non-White populations of SMW. Matthews and colleagues' (2013) study on African American SMW provides further evidence for this finding among women of color, where rates of lifetime Pap testing were high (98.1%) and over 90% of women had received a recommendation by their doctors to get screened for cancer. Again, this study did not examine the source of healthcare services, thus whether or not utilization of community health services circumvents the role of insurance or SRH usage has not been established in this population.

Given SMW find that general sexual health information materials targeting "all women" are not inclusive of women in same-gender sexual relationships (Curmi, Peters, & Salamonson, 2014; Power, McNair, & Carr, 2009), source of health information and associated health literacy levels may explain low STI testing rates. In another study by Agénor and colleagues (2017), behaviorally bisexual women (i.e., women with both male and female lifetime partners) exhibited similar odds of obtaining a Pap test in the past three years as behaviorally heterosexual women (i.e., women with male-only lifetime partners), while, in the same study, women who self-identified as bisexual had significantly lower odds of obtaining a Pap test. One explanation for this discrepancy is the lack of explicit Pap test messaging for bisexual women, which indicates health care messaging as a potential explanatory mechanism for Pap testing odds. Regardless, it is apparent that utilization of SRH services provide certain SMW with an alternate pathway for obtaining provider recommendation for cervical cancer screening, and that this pathway is likely influenced by health information sources.

Chapter 4: The Present Study

The primary goal of this study was to address significant gaps in the cancer literature regarding barriers and facilitators of cervical cancer screening in SMW. Thus, the goals of this study are to examine how different aspects of the Health Equity Promotion Model predict routine screening in a sample of sexual minority women and gender nonbinary individuals (Figure 1). Specifically, the study seeks to investigate how social (Aim 1) and health-promoting and –aversive pathways (Aim 2) predict routine screening. Further, it seeks to examine the interplay of provider heterosexism with other health utilization and communication constructs on cervical cancer screening outcomes (Aim 3), as well as the relationship between health communication and health care utilization factors on cervical cancer screening outcomes (Aim 4).

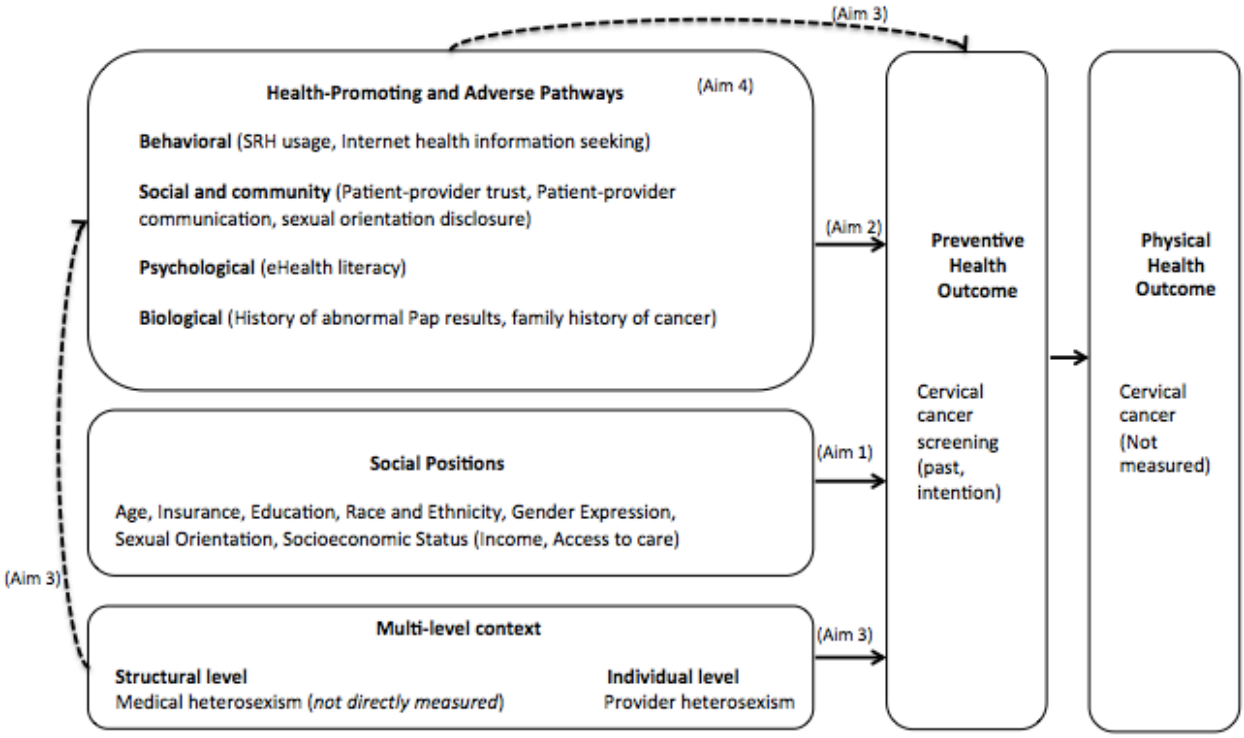

Figure 1. Health Equity Promotion Model Framework adapted to the present study.

This study provides valuable information on contributing factors to cancer screening disparities in a high-risk population. Given the importance of cancer prevention and early detection as a key strategy in lowering cervical cancer morbidity and mortality (National Cancer Institute, 2016), findings from this project can contextualize and establish relationships among intervenable factors (i.e., health information seeking, patient-provider communication, eHealth literacy, provider heterosexism) that can increase rates of screening in SMW and enhance existing messaging involving cervical cancer screening in this population.

Chapter 5: Methods

Participants

Participants (*N*=150) were aged 21 to 53 and recruited using institutional review board (IRB) approved advertisements from multiple LGBT community sites, nightlife, and LGBT-affiliated groups in Richmond, VA. Recruitment was conducted through social media accounts, word of mouth, email Listservs, general membership meetings, and dissemination of flyers, in addition to in-person recruitment at local LGBT venues. A total of 104 participants were recruited in-person and 46 were recruited through the online survey version. Five participants were removed from the dataset due to satisficing (identified by abnormally short survey times and/or selecting improbable or conflicting extremes for all scale responses without attention to deviations in item meaning; i.e., reverse-scored items) and/or degree of missing data (> 50%). The final sample consisted of 145 SMW.

To be eligible for study participation, participants had to be between a.) age 21 to 65, b.) designated female at birth (DFAB), (c) could not be taking hormone replacement therapy for purposes of gender affirmation, (d) identify as a cisgender woman or a nonbinary gender identity, and (e) had to either identify as lesbian, bisexual, queer, another sexual minority identity, OR have currently/previously had sexual, romantic, or dating partners that were not only cisgender men. Participants were not eligible if they were assigned male at birth AND/OR, identified as a transgender woman, OR identified only as a transgender man and not a nonbinary identity. Further, cisgender women and nonbinary individuals were not eligible if they identified as asexual AND did not have a sexual, romantic, or dating history beyond partners who were

cisgender men, OR identified as heterosexual and did not have a sexual, romantic, or dating history beyond cisgender men.[2]

Of these 145 participants, the mean age was 29.30 (*SD* = 6.92). The majority of the sample identified as a cisgender woman (89%), were Non-Hispanic White/Caucasian (73.1%), earned under $50,000 (81%), earned a 4-year college degree or higher (67.6%), was insured (88.3%), were not disabled (83.4%), and did not have a chronic health condition (66.9%). Sexual orientation was diversely represented, with over two-thirds of the sample identifying as an identity other than gay/lesbian. Additionally, the majority of the sample had past relationships with cisgender men (62.8%) or women (72.4%). Over half of the sample was presently partnered with a cisgender man (55.9%), though this statistic includes SMW who are in relationships with more than one person.

[2] These particular gender and sexuality criteria were selected in accordance with more recent gender and sexuality measurement theory (van Anders, 2012) that indicates sexuality is more complex than "same sex" versus "different sex" attraction or behaviors. As the crux of the present study's research questions involves interactions with the health care system that can be influenced by heteronormative assumptions about gender and sexuality, it is important to have a nuanced recording of both gender identity and sexual identity to adequately describe "SMW" beyond gender binary-dependent sexual minority labels. Thus, inclusion criteria were established based on a) shared characteristics of DFAB individuals who do not experience other unique, systemic barriers related to binary transgender identification and hormone replacement therapy (HRT) usage, and b) the qualification of non-heterosexual identity or behavior in sexual minority status as one that acknowledges gender diversity in sexual attraction, behavior, or desire. Additionally, as current norms in population health research are to define SMW by same-sex attraction/behavior or self-identification as lesbian or bisexual, it is likely that the overarching categories represented in the current study's sample are not wholly dissimilar to the samples drawn from studies that use measures of female same sex attraction/behavior as inclusion criteria, with the strength of more precisely representing sample characteristics on dimensions of sexuality and gender while disaggregating transgender individuals from the predominant sex-based classifications of "SMW."

Table 1
Demographics of Study Sample

Variable	*n*	%
Gender		
Cisgender woman	129	89.7
Gender-nonconforming	15	10.3
Sexual Orientation		
Gay/Lesbian	35	24.1
Bisexual/Pansexual	50	34.5
Queer	29	20
Heterosexual or Questioning	23	15.9
Other	8	5.5
Race		
White/Caucasian	106	73.1
African-American/Black	14	9.7
Asian American	5	3.4
Hispanic/Latina/Latino/Latinx	4	2.8
Native American	1	0.7
Multiracial/Multiethnic	14	9.7
Other	1	0.7
Income		
Less than $25,000	59	40.7
$25,000-$49,999	57	39.3
$50,000-$99,999	20	13.8
$100,000 or more	8	5.5
Education		
Grade school	1	0.7
High school/GED	9	6.2
Some college (no degree)	28	19.3
2-year/technical degree	9	6.2
4-year college degree	67	46.2
Master's degree	29	20
Doctorate degree/Professional degree	2	1.4
Insurance		
None	17	11.7
Medicaid	4	2.8
Other government insurance	14	9.7
Private (from job)	74	51
Private (through parents)	26	17.9
Private (Other)	10	6.9
Gender of Previous Romantic, Sexual, and/or Dating Relationships		
Cisgender Men	91	62.8

Cisgender Women	105	72.4
Transgender Men	19	13.1
Transgender Women	17	11.7
Non-binary and//or gender-nonconforming individuals	42	29
No previous relationships	5	3.4
Other Gender	7	4.8
Gender of Current Romantic, Sexual, and/or Dating Relationships		
Cisgender Men	81	55.9
Cisgender Women	64	44.1
Transgender Men	7	4.8
Transgender Women	2	1.4
Non-binary and//or gender-nonconforming individuals	23	15.9
No current relationships	13	9
Other Gender	7	4.8
Gender of Sexual Attraction		
Cisgender Men	89	61.4
Cisgender Women	109	75.2
Transgender Men	51	35.2
Transgender Women	48	33.1
Non-binary and//or gender-nonconforming individuals	73	50.3
Not sexually attracted to anyone	6	4.1
Other Gender	6	4.1
Disability		
Yes	20	13.8
No	121	83.4
Chronic health condition		
Yes	44	30.3
No	97	66.9

Procedure

All recruitment materials contained study information and a link to the online survey (hosted by Qualtrics). Interested participants accessed the study link, which first displayed briefing information, PI contact information, and the electronic informed consent form. Following informed consent and eligibility confirmation through pre-screening items assessing gender and sexual orientation, participants were then able to complete the survey, which took

16.48 minutes (SD = 9.62) to complete on average. Participants could then take the survey in a secure location on their own personal device. For participants who were recruited in-person, surveys were administered on tablets using the Qualtrics website to reduce discrepancies due to data collection mode. Participants who completed the survey on their own device at a later date received a $2.00 Amazon.com digital gift card incentive; those who completed the survey in person could opt to receive a $2.00 cash incentive at the time of completion. At the end of the survey, participants were given a branching logic option, which allows them to select whether or not they would like to provide their email address in order to receive the survey compensation. If they selected yes, they were taken to a final question where they can input their email address. If they selected no, they were redirected to the survey debriefing page. Participants who completed the survey in person took an identical form of the survey that did not have this branching logic item since they were provided compensation in person.

Measures

The follow section describes measures included in the quantitative survey. A full list of items is presented in Appendix A.

Demographics. Demographic items assessed highest level of completed education, sexual orientation, sexual attraction, sexual behavior (partner status, both past and present), gender identity, assigned birth sex, gender expression, age in years, and type of insurance. Gender identity items were taken from a Fenway Health study that tested this two-step version across four studies that assessed Sexual Orientation and Gender Identity data collection methods (Fenway Institute, 2013). An additional two items assessing access to care in terms of medical expense and location of medical services were also included (Cunningham et al., 1995).

Additionally, a categorical variable was created based on race/ethnicity checklist items, with individuals selecting multiple racial or ethnic classifications coded as "Multiracial/Multiethnic."

Healthcare status and service utilization. Number of HPV vaccination doses and age of first dose, ever tested for HIV, ever tested for other STIs, ever used a form of hormonal contraception, and whether or not a participant has seen a primary care physician or obstetrician-gynecologist in the past year was assessed with binary Yes/No items. An HPV vaccination series completion variable was calculated based on age of HPV vaccine initiation, age, and number of doses; coding decisions as "Completed" or "Not Completed" were based on the CDC's guidelines (CDC, 2016), where before 2016, three doses were required, and after 2016, only two doses were required for individuals initiating the series before age 14.

Additionally, two questions assessed whether participants have a usual source of primary care (Yes/No/Don't Know), and if so, what that source is. Additional Yes/No/Don't Know response-type items assessed current tobacco use, alcohol use, weight, height, history of chronic health conditions, family history of cervical cancer, and history of abnormal Pap smears.

Health information seeking behaviors. A dichotomous Yes/No item assessed whether SMW have ever searched for cervical cancer information and information about providers on the Internet, and if so, a checklist-format item assessed sources of health information. A five-point Likert-type item also asked participants to estimate how frequently they searched for Internet health information in the past year. A systematic review of HISB measurements has demonstrated that dichotomous indicators assessing health information sources utilized and Likert-type items assessing frequency of use are common standards of measurement within this area (Anker, Reinhart, & Feeley, 2011).

eHealth literacy. eHealth literacy was assessed using the eHeals instrument (Norman & Skinner, 2006), which has strong internal consistency (α = .88; Norman & Skinner, 2006). The eHeals is an eight-item self-report measure of eHealth literacy, and it examines individuals' comfort, knowledge, and perceived skill at locating and evaluating Internet health information. Scale anchors range from "Strongly Disagree" to "Strongly Agree," and higher total scores indicate greater eHealth literacy. An example item is "I know how to find helpful health resources on the Internet." Within the present sample, this scale demonstrated good internal consistency (α = .93).

Provider heterosexism. Eleven 5-point Likert-type items assessed participants' perceptions of whether providers have ever assumed a participant is heterosexual, whether a participant was treated differently or unfairly after disclosing their sexual orientation, whether intake forms included sexual orientation items, whether providers were able to answer information about SMW's sexual health questions, and other items related to sexual orientation in patient-provider interactions. Nine items related to encounters with providers and an additional two items related to encounters with office staff. Items were informed from previous studies examining perceived heterosexism of SMW (DeHart, 2008; Johnson, Mueller, Eliason, Stuart, & Nemeth, 2016) and qualitative research of SMW's experiences with healthcare providers (Fish & Bewley, 2010; Johnson, Nemeth, Mueller, Eliason, & Stuart, 2016). Within the present sample, this scale demonstrated good internal consistency (α = .88).

Provider referral/recommendation for testing. Provider recommendation was measured with a dichotomous item that assessed whether a provider has ever recommended a Pap smear.

Papanicolaou (Pap) testing. Utilization in the past 3 years and intention in the next 3 years were assessed in order to capture different dimensions of Pap utilization. Further, negative

past experiences may predict lower intention, thus it is important to capture information on intention in addition to whether or not an individual is "on time" regarding their past Pap test. Additionally, past research has shown that intention tends to correlate more with other psychological constructs (Ben-Natan & Adir, 2009; Charlton et al., 2014). Thus, given the aims of this study, it is important to capture correlates of both variables. A single, 5-point Likert-type item assessed perceived likelihood of obtaining screening in the next three years. Past utilization was assessed with a binary yes/no item, an item asking participants for the month and date of their last Pap test, and a binary item asking if they received HPV co-testing with their last Pap test.

For all analyses, a routine (i.e., guideline compliance) variable was computed based on United States Preventive Services Task Force (USPSTF; USPSTF, 2012) and American Cancer Society (ACS; ACS, 2016) guidelines. Individuals between ages 21-29 who reported screening within the past three years and those between ages 30-65 who reported screening in the past five years were coded as "Routine screeners." Participants' age relative to guideline thresholds was also attended to (e.g., if a 31 year old participant reported a screening date from four years ago, they were considered noncompliant since they would have been age 27 at the time of last screen). Endorsement of HPV co-testing at the time of last Pap test was not used due to irregularities with participant reporting. Additionally, history of abnormal Pap smear was not included, as guidelines suggest screening intervals be modified based on recommendation of an individual's health care team, which was not information assessed in this study.

Patient-provider communication. Four items drawn from the Interpersonal Processes of Care Survey Short Form (Stewart, Nápoles-Springer, Gregorich, & Santoyo-Olsson, 2007; Alegría, Sribney, Perez, Laderman, & Keefe, 2009) were used to assess communication with

providers. Item anchors range from 1 (Never) to 5 (Always), and higher total scores indicate better patient-provider communication. The derived four-item short form has demonstrated good internal consistency in previous research (α = 0.75; Alegría, Sribney, Perez, Laderman, & Keefe, 2009). Within the present sample, this scale demonstrated good internal consistency (α = .92).

Patient-provider trust. The eleven-item Trust in Physicians Scale (Anderson & Dedrick, 1990) was used to assess relationship quality between patients and providers. Items are scored on a five-point Likert scale ranging from 1 ("Strongly Disagree") to 5 ("Strongly Agree"), and higher total scores indicate greater trust in physicians. This scale has demonstrated good psychometric quality, including good internal consistency (Anderson & Dedrick, 1990; α = .85-.90), and construct, content, and face validity (Anderson & Dedrick, 1990). This scale has also demonstrated good internal consistency in populations that interact with gynecologists (Krajewska-Kulak et al., 2011; α = .90). Within the present sample, this scale also demonstrated good internal consistency (α = .87).

Sexual orientation disclosure. Disclosure was assessed with three items. Two categorical items assessed past sexual orientation disclosure to a participant's regular source of health care and to a health care practitioner who specifically provides sexual and reproductive health care services. These two items were adapted from previous research that examines sexual orientation disclosure in medical settings (Polek, Hardie, & Crowley, 2008). An additional 5-point Likert item assessed intention to disclose to future health care practitioners who provide sexual health services.

Chapter 6: Results

Data Preparation

Missing Data. Overall, less than 1% of items were missing from each scale. A non-significant Little's MCAR test, $\chi 2(932) = 588.99$, $p = 1.00$, indicated that data were missing completely at random (MCAR; Little, 1988). Generally, when data are MCAR and missing at a rate of less than 5%, single imputation methods using the expectation maximization (EM) algorithm provides unbiased parameter estimates (Enders, 2001). Missing data were imputed using the EM algorithm function of Missing Values Analysis in SPSS Version 24.

Univariate Normality. Next, the dataset was examined for univariate outliers by examining z-score transformed variables. eHealth literacy had three outliers; two were left alone due to being marginal (-3.37, and -3.37). The remaining outlier (-4.00) was Winsorized. Next, all quantitative scale variables were checked for univariate normality (Table 2), with skewness and kurtosis values of | 2 | used as the threshold for non-normality (Gravetter & Wallnau, 2014). However, the eHealth literacy was still moderately leptokurtic (2.42) with an overall mild negative skew (-1.45; Fig. 2). Following recommendations from Tabachnick and Fidell (2007) for negatively skewed distributions, the eHealth Literacy scale was reflected and underwent a square root transformation which resulted in acceptable skewness (.42) and kurtosis (-.23). As the scale direction has been reversed due to the reflection (lower scores now represent higher eHealth literacy), signs on subsequent analysis coefficients (correlation and regression) were flipped for interpretability (and to reflect the original scale anchor directions).

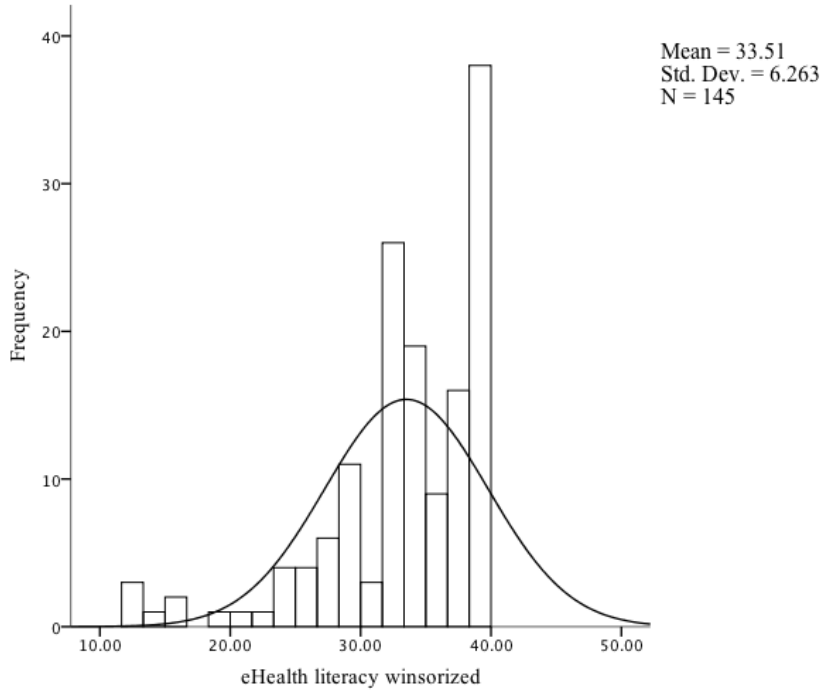

Figure 2. Histogram of Winsorized eHealth Literacy Scale.

Table 2
Descriptive Statistics for Continuous Variables.

	N	Mean	Std. Deviation	Skewness	Kurtosis
Gender Expression	145	2.86	1.37	.73	-.15
Income	144	1.84	.87	.84	.04
Provider Communication Quality	145	10.72	4.98	.31	-.99
eHealth Literacy	145	33.48	6.37	-1.54	2.97
eHealth Literacy (transformed)	145	2.5	1.11	.42	-.23
Provider Trust	145	37.36	7.3	.03	-.28
Medical Heterosexism	145	29.93	9.36	.35	-.05
Access to Care - Transportation	145	3.37	1.27	-.34	-1.06
Access to Care - Cost	145	2.17	1.44	.96	-.56

Note. The first eHealth literacy variable represents the variable before it underwent Winsorization and subsequent transformations. The total potential value for provider communication quality is 20, eHealth literacy 40, provider trust 55, and medical heterosexism 40.

Descriptive Analyses

Health-promoting and –aversive pathways. Frequencies and means were examined. Overall, in the frequency distributions, a large proportion of participants had received a routine Pap test, lifetime Pap test, lifetime HIV test, lifetime birth control consult, and lifetime STI/D test or counseling, which indicates rates of SRH usage in the sample are high (apart from completing the HPV vaccination series, which has a 35.9% completion rate in the present study). Additionally, over 60% of participants have searched for Internet HISB in the past year, seen either a PCP or OBGYN in the past year, or have a provider they regularly see, which indicates care access levels are also relatively high. Additionally, over two-thirds of the sample was either out to a PCP or SRH provider. Family history of cancer and history of abnormal Pap testing were less frequently reported. Finally, among the Likert variables, eHealth literacy and provider trust had high means relative to their total potential scale values, which indicates the sample tended to be more eHealth literate and generally trusted their providers. Provider communication quality tended to be more mixed, with its scale mean close to the center of its score intervals.

Table 3
Frequencies of Health and Healthcare Variables

Variable	*n*	%
Routine Pap Test		
Yes	115	79.3
No	30	20.7
Lifetime Pap Test		
Yes	134	92.4
No	10	6.9
Ever Abnormal Pap Test		
Yes	40	27.6
No	101	69.7
Family history of cancer		
Yes	23	15.9
No	102	70.3
Ever HIV test		
Yes	102	70.3
No	35	24.1

Ever STI/D test or counseling		
Yes	84	57.9
No	59	40.7
Ever birth control consult		
Yes	102	70.3
No	43	29.7
Completed HPV vaccination		
Yes	52	35.9
No	80	55.2
Have regular provider		
Yes	98	67.6
No	40	27.6
Seen PCP past 12 months		
Yes	97	66.9
No	48	33.1
Seen OBGYN past 12 months		
Yes	87	60
No	58	40
Out to PCP		
Yes	83	57.2
No	58	40
Out to SRH provider		
Yes	87	60
No	54	37.2
Internet HISB in past year		
Yes	103	71
No	42	29

Note. Pap is "Papanicolaou," HPV "human papilloma virus," STI/D "sexually transmitted infection/disease," HIV "human immunodeficiency virus," PCP "primary care provider," SRH "sexual and reproductive health," PCP "primary care provider," OBGYN "obstetrician-gynecologist," HISB "health information seeking behavior."

Coding for Inferential Analyses

For purposes of testing in the bivariate and multivariate Aim 1 and 2 models, many categorical variables were dichotomized for both parsimony and to limit the number of predictors that would be entered into analyses (versus the much larger number that would be entered from a dummy coding strategy). Sexual orientation disclosure variables for both PCP and SRH providers were dichotomized as 1 "Disclosed sexual orientation" and 0 "Did not disclose

sexual orientation." Sexual orientation was dichotomized (1 "Other Sexual Orientations," 0 "Gay/Lesbian"), where all participants who reported bisexual, pansexual, queer, heterosexual, asexual, or other identities were coded as "1." Similarly, race/ethnicity was dichotomized into "White" and "Non-White" categories, with multiracial/multiethnic (i.e., those who select multiracial and those who endorsed multiple racial categories) individuals also coded as "Non-White." Insurance was dichotomized into "Insured" and "Not Insured," while education was dichotomized into "4-year degree or higher" and "2-year degree or lower."

Unless otherwise specified, all inferential analyses were conducted using IBM SPSS Version 24.0 software.

Aim 1 Analyses

Hypothesis 1. It was hypothesized that social identity and positions would predict Pap testing outcomes.

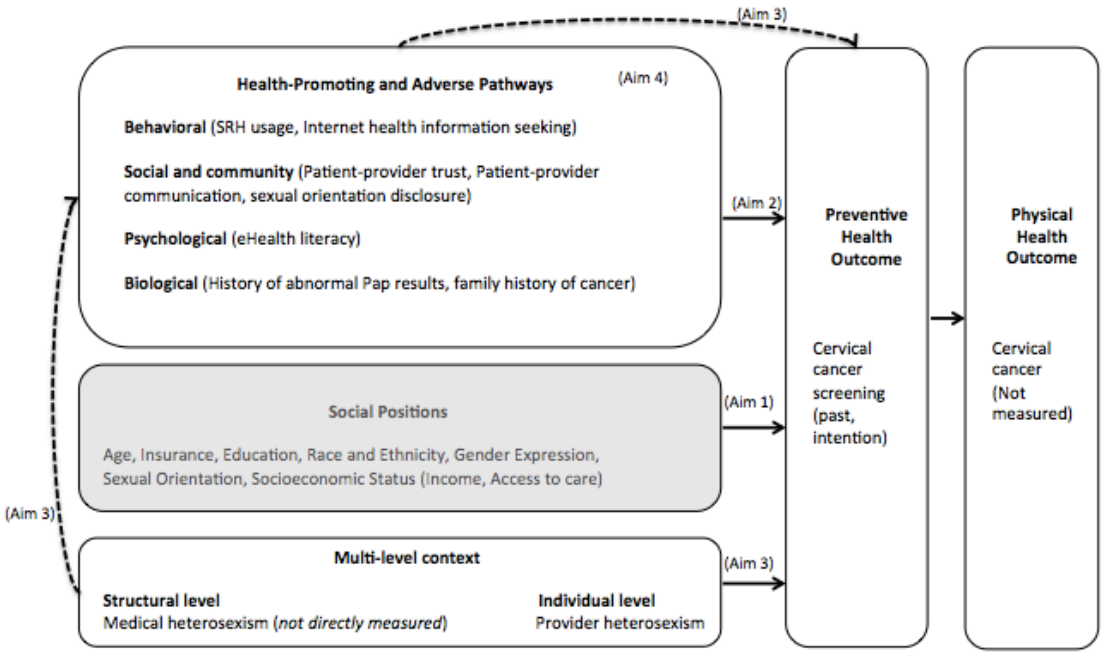

Figure 3. Aim 1 social identity/position constructs.

First, chi-square (Table 4) and independent samples t-test (Table 5) analyses were run between demographic predictors and both routine Pap testing and Pap testing intention outcomes. Chi-square analyses found that having insurance or a 4-year degree or more was significantly associated with an increased likelihood of being a routine screener (ps < .05, Table 4). Additionally, routine screeners (M =2.33) had significantly higher mean access to care due to cost compared to non-screeners (M = 1.57), $t(61.09) = 3.19$, $p = .002$, $eta^2 = .143$; routine screening status explained 14.3% of the variability in access to care due to cost. Also, routine screeners had significantly higher mean access to care due to practice location (M = 3.50) than nonroutine screeners (M = 2.87), $t(143) = 2.50$, $p = .014$, $eta^2 = .042$; routine screening status explained 4.2% of the variability in access to care due to location.

Table 4
Frequency and Chi-Square Analyses of Social Identities/Position by Screening Status

Variable	Non-Screeners (n = 30)	Screeners (n = 115)	χ^2	p
Sexual Orientation			.013	.908
Gay/Lesbian	20	80		
Other	20.9	79.1		
Race			.24	.621
White	21.7	78.3		
Non-White	17.9	82.1		
Education			**5.34**	**.021**
2-year degree or <	31.9	68.1		
4-year degree or >	15.3	84.7		
Insurance			**12.21**	**.002**
Yes	16.4	83.6		
No	52.9	47.1		
Disability			1.06	.375
Yes	30	70		
No	19.8	80.2		

Note. Bold indicates significance at $p < .05$.

Table 5

Independent Samples T-Test Analyses for Social Identities/Positions by Routine Screening Status

Variable	*t*	*df*	*p*
Social Identities/Positions			
Age	1.24	143	.215
Gender Expression	-1.53	143	.129
Income	.52	142	.603
Access - Cost	**3.19**	**61.09**	**.002**
Access - Location	**2.5**	**143**	**.014**

Note. Bold $p < .05$.

Alternatively, Pearson's product moment correlations found that having a more feminine gender expression, having greater access to care due to cost, and having greater access to care due to location were significantly associated with increased screening intentions (*p*s < .05; Table 6). Independent samples t-tests were also conducted between dichotomous social identity/position variables and screening intentions (Table 7). SMW who were insured had significantly higher mean intention ($M = 4.39$) than those who were uninsured ($M = 3.71$), $t(143) = 2.30$, $p = .023$, $eta^2 = .036$; 3.6% of the variability in Pap testing intention was explained by insurance status.

Table 6

Bivariate Correlations Between Social Identities/Positions and Screening Intention

Variable	*r*	*p*
Social Identities/Positions		
Age	.06	.462
Gender Expression	**-.28**	**.001**
Income	.03	.708
Access - Cost	**.22**	**.007**
Access - Location	**.20**	**.017**

Note. Bold $p < .05$, HISB is "health information seeking behavior."

Table 7.
Independent Samples T-Test Analyses for Social Identities/Positions by Screening Intention

Variable	*t*	*df*	*p*
Sexual Orientation	.81	143	.422
Race	.34	143	.738
Education	1.93	143	.056
Insurance	**2.3**	**143**	**.023**
Disability	.57	139	.570

Note. Bold is significant at $p < .05$.

Next, multiple logistic regression was run to predict Pap testing intention from age, income, gender expression, sexual orientation, race, disability, education, insurance, access due to cost, and access due to location. The logistic regression model was statistically significant, $\chi 2(10) = 27.76$, $p = .002$, Nagelkerke $R^2 = .278$. In the logistic regression model predicting Pap testing (Table 8), income was negatively associated with routine Pap testing, and insurance was positively associated with routine Pap testing; no other relationships were significant. This indicates that individuals with higher incomes were .46 times as likely as those with lower incomes to be routine screeners, while individuals who were insured were 5.83 times more likely to be regular screeners than those who are not. Unlike in the bivariate level of analysis, access to care (cost, location) and education level fell to nonsignificance in the multivariate model.

Table 8
Logistic Regressions Predicting Likelihood of Routine Pap Testing

	B	SE	Wald	*df*	*p*	OR	95% CI for Odds Ratio	
							Lower	Upper
Age	.04	.04	.86	1	.354	1.04	.96	1.13
Income	**-.78**	**.39**	**4.10**	**1**	**.043**	**.46**	**.21**	**.98**
Gender Expression	-.25	.19	1.75	1	.185	.78	.54	1.13
Sexual Orientation (Ref: Other)	-.08	.61	.02	1	.891	.92	.28	3.06
Race (Ref: non-White)	-.30	.56	.29	1	.589	.74	.25	2.21
Disability (Ref: Disabled)	-.79	.63	1.61	1	.205	.45	.13	1.54
Education (Ref: ≤ 2-year degree)	.70	.50	1.96	1	.161	2.01	.76	5.33
Insurance (Ref: Uninsured)	**1.76**	**.67**	**7.01**	**1**	**.008**	**5.83**	**1.58**	**21.54**
Access - Location	.36	.19	3.66	1	.056	1.43	.99	2.07

Access - Cost	.48	.26	3.41	1	.065	1.62	.97	2.69

Note. "Ref" is reference group, Pap is "Papanicolaou," ref is "reference," bolded values are significant at $p < .05$.

A multiple linear regression was then run to predict Pap testing intention from age, income, gender expression, sexual orientation, race, disability, education, insurance, access due to cost, and access due to location, $F(10, 129) = 3.26$, $p = .001$, $R^2 = .140$. Gender expression, access to care due to cost, and access to care due to location were significant predictors of Pap testing intention (ps $< .05$), such that intentions were higher for more feminine individuals and those with greater access to care (Table 9). Additionally, being insured was marginally significant ($p = .052$), and was kept in subsequent multiple regression models for Aim 2.

Table 9
Multiple Regressions Predicting Pap Testing Intention for Social Identities and Positions

	B	*SE*	*Beta*	*df*	*p*	95% CI	
						Lower	Upper
Age	.006	.02	.04	.38	.706	-.02	.04
Income	-.21	.14	-.16	-1.54	.125	-.48	.06
Gender Expression	**-.17**	**.07**	**-.20**	**-2.37**	**.019**	**-.31**	**-.03**
Sexual Orientation	.13	.22	.05	.57	.573	-.32	.57
Race	.03	.21	.01	.14	.886	-.39	.45
Disability	.09	.27	.03	.35	.727	-.44	.63
Education	.09	.21	.04	.42	.677	-.32	.49
Insurance	**.58**	**.30**	**.17**	**1.96**	**.052**	**-.01**	**1.17**
Access - Cost	**.19**	**.08**	**.23**	**2.45**	**.016**	**.04**	**.34**
Access - Location	**.19**	**.08**	**.21**	**2.51**	**.013**	**.04**	**.33**

Note. Pap is "Papanicolaou," bolded values are significant at $p < .05$.

Aim 2 Analyses

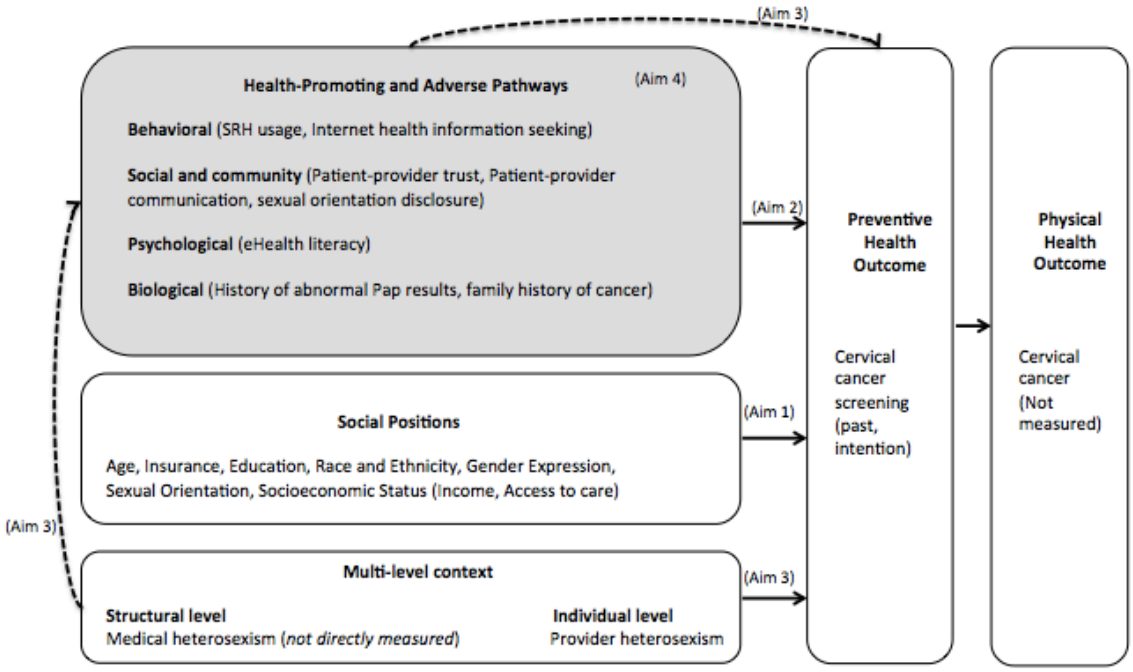

Figure 4. Constructs included in aim 2 analyses.

Hypothesis 2A. First, it was hypothesized that behavioral constructs (lifetime SRH usage, Internet HISB) would be associated with increased likelihood of being a routine screener or increased Pap testing intention. Chi-square and independent samples t-test analyses were run to test for these differences. Among the chi-square analyses (Table 10), only ever receiving an HIV test predicted increased odds of receiving a routine Pap test (p = .043); no other comparisons were significant (Table 10). Additionally, Internet HISB frequency did not differ by routine screening status, $t(143) = .82$, $p = .413$.

Table 10

Frequency and Chi-Square Analyses of Health Pathway Variables by Screening Status

Variable	Non-Screeners (n = 30)	Screeners (n = 115)	χ^2	*p*
Behavioral Pathways				
Ever HIV test			**4.08**	**.043**
Yes	15.7	84.3		
No	31.4	68.6		
Ever STI/D test or counseling			0.191	.662
Yes	19	81		
No	22	78		
Ever birth control consult			3.39	.065
Yes	16.7	83.3		
No	30.2	69.8		
Completed HPV vaccination			.45	.502
Yes	15.4	84.6		
No	20	80		

Note. Pap is "Papanicolaou," HIV "human immunodeficiency virus," STI/D "sexually transmitted disease/infection," HPV "human papillomavirus," PCP "primary care provider," SRH "sexual and reproductive health." Bolded values are significant at $p < .05$.

Independent samples t-tests and Pearson product moment correlations were run to examine associations between behavioral pathways and Pap testing intention. In a Pearson's product moment correlation, Internet HISB frequency was not significantly associated with Pap testing intention, $r = .14$, $p = .088$. Based on the independent samples t-tests (Table 11), ever having a birth control consultation and completing the HPV vaccination series were associated with higher Pap testing intentions (ps < .05). Individuals who had ever received a birth control consultation ($M = 4.48$) had significantly higher mean Pap testing intentions than those who did not ($M = 3.91$), $t(61.86) = 2.44$, $p = .018$, $\text{eta}^2 = .088$; ever receiving a birth control consult explained 8.8% of the variability in Pap testing intention. Similarly, individuals who completed the HPV vaccination series ($M = 4.60$) had significantly higher mean intention scores than those who did not ($M = 4.21$), $t(128.82) = 2.06$, $p = .042$, eta = .0319. Completing the HPV vaccination

series explained 3.19% of the variability in Pap testing intention. No other comparisons were significant at the bivariate level (Table 11).

Table 11
Independent T-Test Analyses for Behavioral Variables by Pap Testing Intention

Variable	*t*	*df*	*p*
Behavioral Pathways			
Ever HIV test	.25	135	.802
Ever STI/D test or counseling	1.16	141	.248
Ever birth control consult	**2.44**	**61.86**	**.018**
Completed HPV vaccination	**2.06**	**128.82**	**.042**

Note. Pap is "Papanicolaou," HIV "human immunodeficiency virus," STI/D "sexually transmitted disease/infection," HPV "human papillomavirus." Bolded values are significant at $p < .05$.

A multiple logistic regression was then run to predict Pap testing intention from gender expression, insurance, access due to cost, access due to location, ever having an HIV test, ever having an STI/D test/counseling, ever having a birth control consult, completing the HPV vaccination series, and frequency of Internet HISB. The overall logistic regression model was not statistically significant, $\chi 2(7) = 11.78$, $p = .108$, Nagelkerke $R^2 = .150$. In the logistic regression model (Table 12), individuals who reported ever receiving an HIV test were 3.52 times more likely to be routine screeners than those who did not ($p = .025$); all other pathways were nonsignificant, with income and insurance also falling to nonsignificance.

Table 12
Logistic Regressions Predicting Likelihood of Routine Pap Testing by Behavioral Pathways

	B	SE	Wald	*df*	*p*	OR	95% CI for Odds Ratio	
							Lower	Upper
Social Identities/Positions								
Income	.001	.32	0	1	.998	1.00	.54	1.87
Insured	1.38	.73	3.58	1	.058	3.98	.95	16.63
Behavioral Pathways								
Ever HIV test	**1.26**	**.56**	**5.00**	**1**	**.025**	**3.52**	**1.17**	**10.59**
Ever STI/D test or counseling	-.84	.61	1.86	1	.172	.43	.13	1.44
Ever birth control consult	.85	.57	2.22	1	.136	2.34	.77	7.16

Completed HPV vaccination	.25	.53	.22	1	.636	1.29	.45	3.67
Internet HISB Frequency	.05	.32	.03	1	.875	1.05	.57	1.95

Note. Pap is "Papanicolaou," HISB "health information seeking behavior," HIV "human immunodeficiency virus," HPV "human papillomavirus," bolded value are significant at $p < .05$.

A multiple linear regression was then run to predict Pap testing intention from gender expression, insurance, access due to cost, access due to location, ever having an HIV test, ever having an STI/D test/counseling, ever having a birth control consult, completing the HPV vaccination series, and frequency of Internet HISB, $F(9, 114) = 3.19$, $p = .002$, $R^2 = .138$. Only gender expression and access to care due to cost predicted Pap testing intention ($ps < .05$); no specific behavioral pathways predicted Pap testing intentions (Table 13). Both ever receiving a birth control consult and ever receiving an HIV test fell to nonsignificance in the multivariate model.

Table 13

Multiple Regressions Predicting Pap Testing Intention by Behavioral Pathways

	B	*SE*	*Beta*	*df*	*p*	95% CI	
						Lower	Upper
Social Identities/Positions							
Gender Expression	**-.20**	**.07**	**-.24**	**-2.75**	**.007**	**-.34**	**-.06**
Insurance	.50	.34	.13	1.48	.142	-.17	1.18
Access - Cost	**.15**	**.07**	**.19**	**2.04**	**.044**	**.004**	**.30**
Access - Location	.02	.08	.02	.26	.792	-.14	.18
Behavioral Pathways							
Ever HIV test	-.08	.23	-.03	-.35	.729	-.54	.38
Ever STI/D test or counseling	.08	.21	.03	.37	.714	-.34	.49
Ever birth control consult	.27	.24	.11	1.15	.254	-.20	.75
Completed HPV vaccination	.32	.20	.14	1.60	.113	-.08	.71
Internet HISB Frequency	.13	.12	.10	1.12	.266	-.10	.36

Note. Pap is "Papanicolaou," HISB "health information seeking behavior," HIV "human immunodeficiency virus," HPV "human papillomavirus," bolded values are significant at $p < .05$.

Hypothesis 2B. Second, it was predicted that social and community constructs (provider trust, patient-provider communication, sexual orientation disclosure) would be associated with

the likelihood of being a routine screener or Pap testing intention. At the bivariate level, chi-square analyses showed that being "out" to an SRH provider predicted increased odds of receiving a routine Pap test ($p < .001$); no other comparisons were significant (Table 14). Additionally, in an independent samples t-test, SMW who were routine screeners had significantly higher mean provider communication quality scores ($M = 11.30$) than those who were not ($M = 8.50$), $t(143) = 2.81$, $p = .006$, $eta^2 = .052$; routine screening status explained 5.2% of the variability in provider communication quality. However, routine screening status was not significantly associated with provider trust, $t(143) = .67$, $p = .502$.

Table 14

Frequency and Chi-Square Analyses of Social and Community Variables by Screening Status.

Variable	Non-Screeners (n = 30)	Screeners (n = 115)	χ^2	*p*
Out to PCP			2.97	.085
Yes	15.7	84.3		
No	27.6	72.4		
Out to SRH provider			**5.25**	**.022**
Yes	13.8	86.2		
No	29.6	70.4		

Note. Pap is "Papanicolaou," PCP "primary care provider," SRH "sexual and reproductive health." Bolded values are significant at $p < .05$.

A series of independent samples t-tests and Pearson's product moment correlations were also run to examine the associations between social and community predictors and Pap testing intentions. At the bivariate level, greater provider trust, better provider communication quality, and disclosing sexual orientation to either a PCP or an SRH provider were all associated with Pap testing intention. SMW who were out to their SRH providers ($M = 4.49$) had significantly greater mean intention scores than those who were not out ($M = 4.06$), $t(89.48) = 2.06$, $p = .043$, $eta^2 = .045$; being out to an SRH provider explained 4.5% of the variability in Pap testing

intention. Similarly, SMW who were out to their PCP ($M = 4.59$) had significantly higher mean Pap testing intention than those who were not out ($M = 3.98$), $t(89.71) = 2.97$, $p = .004$, $eta^2 = .09$; being out to one's PCP explained 9% of the variability in Pap testing intention. Additionally, as provider communication quality ($r = .33$, $p < .001$) or provider trust increased ($r = .34$, $p < .001$), Pap testing intention also increased.

Next, a multiple logistic regression was run in order to predict routine screening from gender expression, insurance, access due to cost, access due to location, provider communication quality, provider trust, sexual orientation disclosure to a PCP, and sexual orientation disclosure to an SRH provider. The logistic regression model was statistically significant, $\chi 2(6) = 20.32$, $p = .002$, Nagelkerke $R^2 = .219$. In the logistic regression model (Table 15), both insurance status and provider communication quality were significantly associated with likelihood of being a routine screener (ps <.05); no other pathways were significant and income fell to nonsignificance. Every one-point increase in provider communication was associated with a 12% greater likelihood of routine Pap testing. Disclosure to an SRH provider, which was significant in the bivariate analysis, was no longer significant in the multivariate model.

Table 15
Logistic Regression Predicting Likelihood of Routine Pap Resting by Social and Community Factors.

	B	SE	Wald	*df*	*p*	OR	95% CI for Odds Ratio	
							Lower	Upper
Social Identities/Positions								
Income	-.13	.28	.20	1	.658	.88	.51	1.54
Insured	**2.03**	**.63**	**10.56**	**1**	**.001**	**7.62**	**2.24**	**25.93**
Social & Community Pathways								
Provider Trust	-.02	.04	.23	1	.630	.98	.92	1.05
Provider Communication	**.12**	**.06**	**4.19**	**1**	**.041**	**1.12**	**1.01**	**1.26**
Disclosure to PCP	-.28	.84	.11	1	.738	.75	.14	3.94
Disclosure to SRH Provider	.97	.83	1.38	1	.240	2.64	.52	13.41

Note. Pap is "Papanicolaou," PCP "primary care provider," SRH "sexual and reproductive

health," bolded values are significant at $p < .05$.

A multiple linear regression was then run to predict Pap testing intention from gender expression, insurance, access due to cost, access due to location, provider communication quality, provider trust, sexual orientation disclosure to a PCP, and sexual orientation disclosure to an SRH provider, $F(8, 128) = 6.73$, $p < .001$, $R^2 = .252$. Gender expression and provider trust significantly predicted Pap testing intention (ps < .05), such that more trust in providers was associated with greater Pap testing intention (Table 16). Both provider communication quality and sexual orientation disclosure to an SRH provider fell to nonsignificance in the multivariate model.

Table 16
Multiple Regressions Predicting Pap Resting Intention by Social and Community Factors

	B	*SE*	*Beta*	*df*	*p*	95% CI	
						Lower	Upper
Social Identities/Positions							
Gender Expression	**-.21**	**.06**	**-.25**	**-3.34**	**.001**	**-.34**	**-.09**
Insurance	.31	.28	.09	1.14	.257	-.23	.86
Access - Cost	.07	.07	.09	1.02	.309	-.06	.20
Access - Location	.12	.07	.14	1.71	.089	-.019	.26
Communication Pathways							
Provider Communication	.03	.02	.12	1.41	.160	-.01	.07
Provider Trust	**.03**	**.01**	**.18**	**2.09**	**.038**	**.001**	**.05**
Disclosure to PCP	.54	.31	.24	1.74	.084	-.08	1.16
Disclosure to SRH Provider	-.05	.31	-.02	-.15	.884	-.66	.57

Note. Pap is "Papanicolaou," PCP "primary care provider," SRH "sexual and reproductive health," and bolded values are significant at $p < .05$.

Hypothesis 2C. Third, it was hypothesized that psychological constructs (perceived eHealth literacy) would be associated with Pap testing intention. At the bivariate level, Pearson's product moment correlations showed that eHealth literacy was significantly and positively associated with screening intentions, $r = .25$, $p = .003$. A multiple linear regression was then run

to predict Pap testing intention from gender expression, insurance, access due to cost, access due to transportation, and eHealth literacy, $F(5, 139) = 6.55$, $p < .001$, $R^2 = .162$. Only gender expression and eHealth literacy predicted Pap testing intention (ps < .05), such that intentions were higher for those with more feminine gender expressions and higher eHealth literacy (Table 17).

Table 17
Multiple Regressions Predicting Pap Testing Intention by Psychological Factors

	B	*SE*	*Beta*	*df*	*p*	95% CI	
						Lower	Upper
Social Identities/Positions							
Gender Expression	**-.23**	**.07**	**-.27**	**-3.48**	**.001**	**-.36**	**-.10**
Insurance	.47	.29	.13	1.60	.112	-.11	1.04
Access - Cost	.10	.07	.13	1.55	.124	-.03	.23
Access - Location	.11	.07	.12	1.45	.151	-.04	.25
Psychological Pathways							
eHealth literacy	**.18**	**.08**	**.17**	**2.12**	**.036**	**.34**	**.012**

Note. Pap is "Papanicolaou," bolded values are significant at $p < .05$.

Hypothesis 2D. Finally, it was hypothesized that biological constructs (family history of cervical cancer, history of abnormal Pap tests) would be associated with increased likelihood of being a routine screener or higher Pap testing intention. At the bivariate and multivariate level, family history of cervical cancer was not associated with routine Pap testing status (Table 18, 19). However, a chi-square analysis found that ever having an abnormal Pap test was significantly associated with being a routine screener (Table 18).

Table 18
Frequency and Chi-square Analyses of Biological Factors by Screening Status

Variable	Non-Screeners (n = 30)	Screeners (n = 115)	χ^2	*p*
Ever abnormal Pap Test			**14.46**	**< .001**
Yes	0	100		
No	28.7	71.3		
Family history of cancer			.053	.779
Yes	21.7	78.3		

No	19.6	80.4

Note. Pap is "Papanicolaou," bolded values are significant at $p < .05$.

Abnormal Pap testing was omitted as a factor in the multivariate model (Table 19) since 100% of SMW with abnormal Pap test history were routine screeners. The model was run with income, insurance, and family history as predictors of routine screening. The overall logistic regression model was not statistically significant, $\chi 2(3) = 7.21$, $p = .065$, Nagelkerke $R^2 = .089$.

Table 19

Logistic Regressions Predicting Likelihood of Routine Pap Testing by Biological Factors

	B	SE	Wald	*df*	*p*	OR	95% CI for Odds Ratio	
							Lower	Upper
Social Identities/Positions								
Income	-.03	.28	.01	1	.929	.98	.57	1.69
Insured	**1.65**	**.63**	**6.92**	**1**	**.009**	**5.22**	**1.52**	**17.90**
Biological Pathways								
Family history	.04	.60	.004	1	.952	1.04	.32	3.33

Note. Pap is "Papanicolaou," bold is significant at $p < .05$.

Ever receiving an abnormal Pap test was also significant at the bivariate level when Pap testing intention was the outcome: in an independent samples t-test, SMW who ever received an abnormal Pap result ($M = 4.70$) had significantly higher mean intention scores than those who had not ($M = 4.16$), $t(112.07) = 3.07$, $p = .003$, $\text{eta}^2 = .027$. Ever having an abnormal Pap test explained 2.7 percent of the variability in Pap testing intention. However, family history of cervical cancer was not associated with Pap testing intention, $t(123) = .37$, $p = .713$.

A multiple linear regression was then run to predict Pap testing intention from gender expression, insurance, access due to cost, access due to transportation, family history of cervical cancer, and ever having an abnormal Pap test, $F(6, 114) = 3.35$, $p = .004$, $R^2 = .105$. Only gender expression predicted Pap testing intention ($p = .012$); no specific biological pathways significantly predicted Pap testing intention in the multivariate model (Table 20).

Table 20

Multiple Regressions Predicting Pap Testing Intention by Biological Factors

	B	*SE*	*Beta*	*df*	*p*	95% CI	
						Lower	Upper
Social Identities/Positions							
Gender Expression	**-.19**	**.07**	**-.22**	**-2.54**	**.012**	**-.33**	**-.04**
Insurance	.49	.34	.13	1.42	.158	-.19	1.17
Access - Cost	.08	.08	.10	1.20	.275	-.07	.23
Access - Location	.16	.08	.17	1.91	.059	-.01	.33
Biological Pathways							
Family history	.26	.27	.08	.94	.351	-.28	.80
Ever abnormal Pap	.32	.23	.12	1.37	.173	-.14	.78

Note. Pap is "Papanicolaou," bolded values are significant at $p < .05$.

Aim 3 Analyses

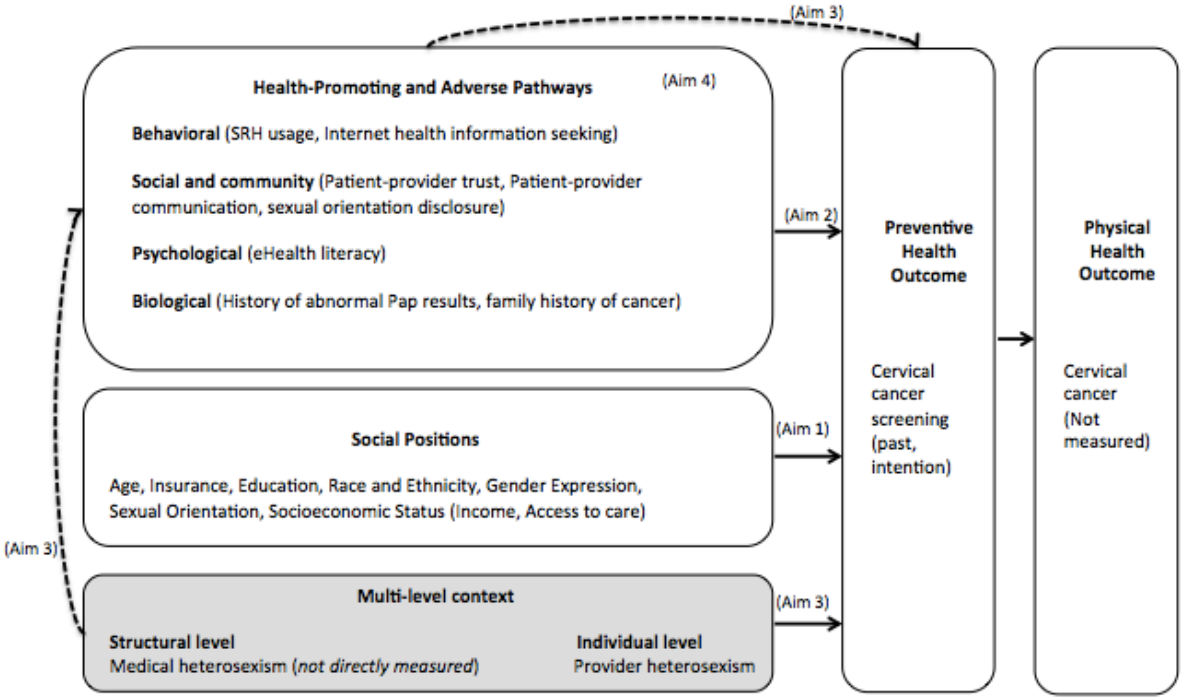

Figure 5. *Constructs included in aim 3 analyses.*

Endorsement patterns of heterosexism scale items were first examined in order to assess which types of medical heterosexism were most frequently experienced by the study sample (Table 21). Overall, assumptions of heterosexuality from providers or their staff were more

frequently reported by participants, while it was rare to be treated differently/unfairly after sexual orientation disclosure or to be told Pap testing was unnecessary due to sexual orientation or partner gender.

Table 21
Descriptive Statistics for Medical Heterosexism Scale Items

	Mean	Standard Deviation
How often did doctors or healthcare professionals…		
Assume you are heterosexual	3.84	1.31
Treat you differently or unfairly after disclosing your sexual orientation	1.69	.98
Fail to ask about your sexual orientation during appointments or on intake forms	3.64	1.42
Fail to provide information about your sexual or reproductive health risks	2.76	1.24
Failed to ask you about your sexuality or partner status	3.10	1.34
Failed to ask you about your sexual behavior	2.69	1.27
Made you feel uncomfortable or ashamed of your sexual identity and/or behaviors	1.88	1.08
Made you feel uncomfortable asking for certain health services	2.12	1.22
Tell you that you did not need a Pap test due to your sexual orientation or the gender of your sexual partners	1.48	.97
Tell you that you did not need to get tested for STIs due to your sexual orientation or the gender of your sexual partners	1.47	1.00
How often did office staff at a doctor or health professional's office…		
Assume you are heterosexual	3.67	1.44
Treat you differently or unfairly after disclosing your sexual orientation	1.59	1.01

Note. Scale anchor minimum is 1 (Never), maximum 5 (Always), STI is "sexually transmitted infections," Pap is "Papanicolaou."

Hypothesis 3A. It was hypothesized that communication and trust with providers would mediate the relationship between perceived medical heterosexism and routine Pap testing. Prior to running the analysis, the data was assessed for multivariate outliers using Mahalanobis' distance; no multivariate outliers were present (ps > .001).

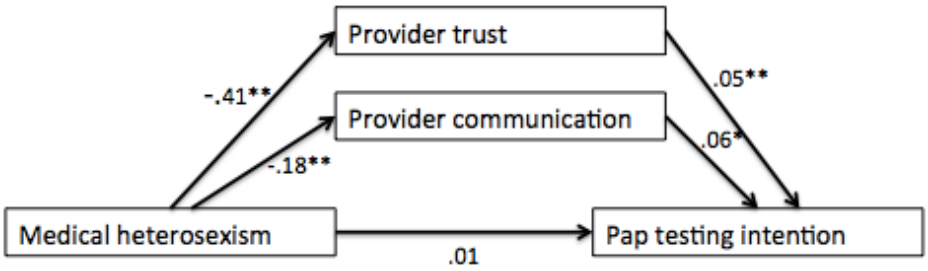

Figure 6. The simultaneous multiple mediation of provider trust and communication on the relationship between medical heterosexism and Pap testing intention,* $p < .05$, ** $p < .001$.

A multiple mediation model (Figure 6) with bootstrapping ($n = 5000$ iterations) was run using the PROCESS version 2.16.3 macro (Hayes, 2016). Per guidance from Hayes (2012), unstandardized coefficients were reported for all pathways. First, perceived medical heterosexism was significantly and negatively associated with both provider communication quality ($b = -.18$, $p < .001$, 95% C.I. [-.27, -.10]) and provider trust ($b = -.41$, $p < .001$, 95% C.I. [-.52, -.30]); this indicates that as perceived medical heterosexism increases, trust in providers and quality of communication decreases. Next, both provider trust ($b = .05$, $p = .001$, 95% C.I. [.02, .08]) and provider communication quality ($b = .06$, $p = .003$, 95% C.I. [.02, .10]) were positively and significantly associated with future Pap testing intention; ergo, as both trust in providers and communication quality increases, so does one's intention to receive a Pap test in the next three years. Finally, the direct effect pathway between perceived medical heterosexism and Pap testing intention was not significant ($b = .01$, $p = .224$, 95% C.I. [-.01, .04]), while the total indirect effect was significant ($b = -.03$, 95% C.I. [-.05, -.02], $\beta = -.25$, 95% C.I. [-.38, -.15]), which indicates this is a significant mediation effect. As perceived medical heterosexism increases, both provider trust and communication quality decrease, which results in lower overall intention to receive a Pap test in the next three years.

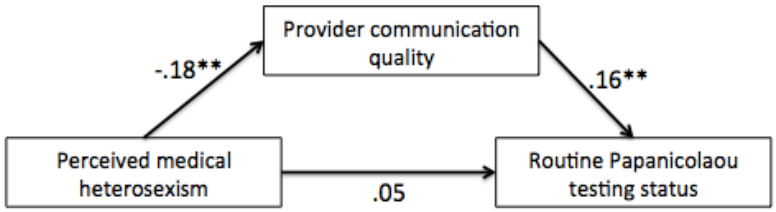

Figure 7. Mediation model of provider communication quality on the relationship between perceived medical heterosexism and routine Pap testing status, ,* $p < .05$, ** $p < .001$.

A second mediation model was run with routine Pap testing as the outcome and only provider communication quality as the predictor (as provider trust was not previously significant at the bivariate level; Figure 7). The direct effect path between medical heterosexism and routine Pap testing was not significant ($b = .05$, $p = .07$, 95% C.I. [.00, .10]). However, medical heterosexism was significantly and negatively associated with provider communication quality ($b = -.18$, $p < .001$, 95% C.I. [-.27, -.10]), which was in turn positively associated with likelihood of routine Pap testing ($b = .16$, $p < .001$, 95% C.I. [.06, .26]). The indirect effect was also significant ($b = -.03$, 95% C.I. [-.06, -.01]). As the direct path was not significant and the indirect path was significant, this indicates there is a mediation effect of provider communication quality on the relationship between medical heterosexism and likelihood of routine Pap testing. As perceived medical heterosexism increases, provider communication quality decreases, which results in a lower overall likelihood of being a routine screener.

Exploratory analyses. Two independent samples t-tests were run between perceived medical heterosexism and the two sexual orientation disclosure variables. SMW who were out to their PCP ($M = 28.41$) reported significantly less medical heterosexism than those who were not out ($M = 31.88$), $t(139) = -2.18$, $p = .031$, $\text{eta}^2 = .03$. Whether or not SMW were out to their PCP explained 3% of the variability in perceived medical heterosexism, a small effect. However,

there was no significant mean difference between SMW who were out to an SRH provider (M = 29.04) and those who were not out (M = 31.06), $t(139) = -1.25$, $p = .212$.

Finally, whether or not there were differences in perceived levels of medical heterosexism by gender (cisgender woman, gender non-binary, gender expression, or sexual orientation (gay/lesbian, other)) was examined. For this analysis, sexual orientation categories were consolidated into a categorical variable, with 1 "Gay/Lesbian," 2 "Bisexual/Pansexual," 3 "Queer," "4 Heterosexual or Questioning," 5 "Other." Individuals who endorsed multiple categories (e.g., Gay/Lesbian and Queer) were coded as "Other."

First, a one-way between subjects ANOVA was conducted between sexual orientation and perceived medical heterosexism; however, there were no significant differences within the omnibus test, $F(4, 140) = 1.95$, $p = .106$. Next, an independent samples t-test was conducted between gender and perceived medical heterosexism. Given the exploratory and nonspecific nature of this set of analyses, a Bonferroni correction was applied in order to control for familywise error, and the required p-value for statistical significance was .001. Again, there was no significant difference in perceived levels of medical heterosexism by gender, $t(142) = -2.50$, $p = .014$. Finally, a Pearson's product moment correlation was conducted between gender expression and perceived medical heterosexism; the association was not significant, $r = .04$, $p = .600$.

Aim 4 Analyses

Hypothesis 4A. First, it was hypothesized that type of primary care (women's health center, student health center, community health center, private practitioner) would differentially predict social and community factors (patient-provider trust, patient-provider communication). First, two one-way between subjects ANOVA analyses were conducted between type of primary

care and one of the two social and community factors, with a Tukey's HSD post-hoc analysis. There were no significant differences in provider communication quality by provider type based on the omnibus test, $F(3, 121) = .98$, $p = .407$. However, provider trust did significantly differ by type of provider, $F(3, 121) = 4.08$, $p = .008$. A Tukey's HSD post hoc analysis found that SMW who went to a private practitioner had significantly more trust in their providers ($M = 39.43$) than those who went to a community health center ($M = 33.85$). No other comparisons were significant.

Hypothesis 4B. Finally, it was hypothesized that Internet health information seeking behaviors would mediate the relationship between eHealth literacy and Pap testing intentions. A mediation model with bootstrapping ($n = 5000$ iterations) was run using the PROCESS macro, version 2.16.3 (Hayes, 2016). Prior to running the mediation analysis, variables were assessed for multivariate outliers using Mahalanobis' distance. There were no significant multivariate outliers ($ps > .001$).

First, the direct effect of eHealth literacy on Internet HISB was significant, $b = .13$, $p = .034$, 95% C.I. (.01, .25). However, there was no significant association between Internet HISB and Pap testing intention, $b = .15$, $p = .216$, 95% C.I. (-.09, .38). Additionally, the direct path between eHealth literacy and Pap testing intention was significant, $b = .24$, $p = .006$, 95% C.I. (.07, .41). Finally, the total indirect path was not significant, $b = -.02$, 95% C.I. (-.08, .006), since the confidence interval contained zero. This indicates that though eHealth literacy predicts both increased Internet HISB and Pap testing intention, the association between eHealth literacy and Pap testing intention is not mediated by Internet health information seeking behaviors (Figure 8).

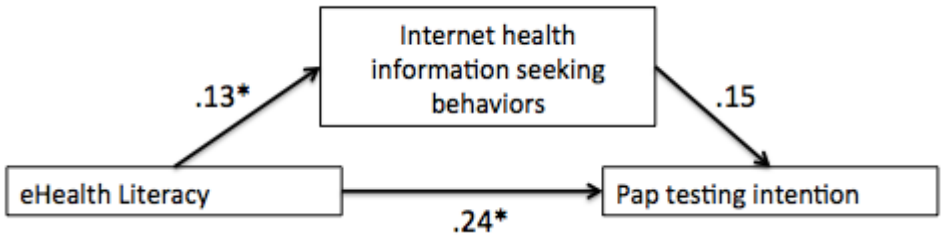

Figure 8. Mediation model of Internet health information seeking behaviors (HISB) on the relationship between eHealth literacy and Papanicolaou (Pap) testing intention,* $p < .05$, ** $p < .001$.

Chapter 7: Discussion

The goal of the present study was to explore barriers and facilitators of cervical cancer screening in SMW based on the theoretical framework of the Health Equity Promotion Model (HEPM; Fredriksen-Goldsen et al., 2014). It was hypothesized that social identity and position (Aim 1) and health-promoting and –aversive (Aim 2) factors would be differentially associated with cervical cancer screening outcomes. Further, the relationships among the multi-level context, medical heterosexism, and health-promoting and –aversive factors were examined (Aim 3). Finally, the relationships among health communication factors were explored (Aim 4).

Aim 1

Within the first aim, it was hypothesized that certain social identities and positions would differentially predict Pap testing outcomes. Overall, this hypothesis was partially supported. First, bivariate and multivariate analyses were run between these predictors and the routine Pap test outcome. At the bivariate level, having a four-year degree or more, having insurance, greater access to care due to cost, and greater access to care due to provider location were each significantly and positively associated with routine screening status. Within the multivariate model, only insurance remained significant and positively associated with routine screening status. Additionally, income became significantly and negatively associated with routine screening status in the multivariate model. Next, these same predictors were tested with future Pap testing intention as the outcome. At the bivariate and multivariate levels, more feminine gender expression, being insured, greater access to care due to cost, and greater access to care due to location were significantly associated with increased screening intention. Aside from the

inverse relationship with income, these findings are consistent with the larger literature on SMW and Pap testing rates (Solazzo, Gorman, & Denney, 2017; Hiestand, Horne, & Levitt, 2007). Notably, being insured had a large odds ratio in most logistic regression models, and may subsequently contribute to a large proportion of variability within these models. It is likely that income is associated with a third, confounding variable not assessed in the current study (e.g., student status, number of dependents). As most individuals in the study were privately insured, this is unlikely to be due to discrepancies in privately insured SMW versus those on Medicaid. Alternatively, given income was not significant at the bivariate level with either outcome, this finding may likely be due to the existence of a suppression effect.

Age, race, sexual orientation, and disability status were not significantly associated with Pap testing outcomes at either the bivariate or multivariate level. These null findings run largely contrary to the larger literature, which has found younger age (Solazzo, Gorman, & Denney, 2017; Clark et al., 2009; Ben-Natan & Adir, 2009; Douglas et al., 2015) and identifying as gay/lesbian (Agénor, Krieger, Austin, Haneuse, & Gottlieb, 2014a; Charlton et al., 2011; Douglas, Deacon, & Mooney-Somers, 2015; Buchmueller & Carpenter, 2010), as being inversely associated with screening status in SMW. However, the present study compared gay/lesbian SMW to other SMW, while past studies compared SMW to heterosexual reference groups. Extant literature on race, sexual orientation, and Pap testing is more complicated. It is likely that race and sexual orientation interact to influence Pap outcomes (Agénor, Krieger, Austin, Hanuese, & Gottlieb, 2014b; Matthews et al., 2013), which was not tested in the present study due to the inadequate power needed to test for an interaction between variables with small comparison groups (e.g., non-White individuals). Research also points to lower access to care for disabled individuals in the general population of adults (Horner-Johnson, Dobbertin, Andersen,

& Iezzoni, 2014; Horner-Johnson, Dobbertin, & Iezzoni, 2015; Reidy, Denieffe, & Foran, 2014). One explanation for these null findings may be the general homogeneity of the sample in term of participant demographics, as the sample was largely White, non-disabled, SMW with a mean age of 29.30, who predominately identified as a sexual orientation other than gay/lesbian.

Aim 2

In the second aim, it was hypothesized that health –aversive and –promoting pathways (behavioral, social and community, psychological, and biological) would each predict Pap testing outcomes. Again, these sets of hypotheses were partially supported.

Behavioral constructs. First, a series of chi-square and independent samples t-test analyses were conducted between behavioral constructs and routine screening status. At the bivariate level, only ever receiving an HIV test was associated with increased odds of being a routine screener. With Pap testing intention as the outcome, completing the HPV vaccination series and ever having a birth control consult predicted greater mean screening intention.

These findings are consistent with past research of SMW that found SRH pathways are associated with increased rates of Pap testing for White SMW (Agénor, Krieger, Austin, Hanuese, & Gottlieb, 2014b) and SMW in general (Douglas, Deacon, & Mooney-Somers, 2015; Charlton et al., 2014). Though not every indicator (e.g., STI/D testing) was a significant predictor, the finding that having a birth control consult and completing the HPV vaccination was associated with screening intentions (and in the case of HIV testing, ever having an HIV test) confirms previous findings about SRH acting as an opportunistic pathway to screening. Additionally, given the low rates of HPV vaccination completion (32%, McRee, Katz, Paskett, & Reiter, 2014; 17.8%, Agénor et al., 2016), its positive association with screening intentions may represent that SMW who do complete the vaccination series are very health oriented and more

likely to pursue other SRH services (like Pap testing). Notably, both rates of HPV vaccination completion (35.9%) and lifetime HIV testing (70.3%) were relatively high in our sample compared to prior research. High SRH utilization rates may be explained by the number of SMW who were currently (55.9%) or previously (62.8%) partnered with a cisgender man, which tends to act as an opportunistic pathway for SRH service usage (Agénor, Krieger, Austin, Haneuse, & Gottlieb, 2014a). More research should be conducted on the qualities of SMW who do complete the HPV vaccination series, and how unique qualities among them may be health protective concerning other sexual health aspects.

At the multivariate level, ever having an HIV test remained significantly and positively associated with the likelihood of being a routine screener. HIV screening rates tend to be low among women, including SMW (44-65%, Conron, Mimiaga, & Landers, 2010), and this association with Pap testing may again represent SMW who are specifically highly motivated to screen. As the present study did not assess aspects of health motivation, like perceived susceptibility or benefits of screening, its association cannot be determined. However, past research on the Health Belief Model (Tracy et al., 2010; Tracy et al., 2013; Ben-Natan et al., 2009), has found that perceived barriers (e.g., expectations of pain or discomfort) and perceived health benefits were associated with increased rates of screening guideline adherence and intentions in SMW. Additionally, qualitative and mixed methods research on SMW has found that SMW tend to view themselves as being at low risk for HPV, STIs, and cervical cancer (Darwin & Campbell, 2009; Power, McNair, & Carr, 2009; Curmi, Salamonson, & Peters, 2014). Future research should seek to investigate the relationships among SRH usage, cervical cancer screening beliefs, and Pap testing among SMW.

Ever having an STI test or counseling and Internet HISB frequency were not statistically significant predictors for either Pap testing outcome at the bivariate or multivariate level. The first null finding of STI testing is in line with a study by Agénor and colleagues (2017), which found that testing in the past year did not attenuate odds of screening among lesbian women (compared to heterosexual women). However, the larger literature does point to past year STI testing increasing odds of past-year screening (Agénor, Krieger, Austin, Hanuese, & Gottlieb, 2014a), and ever having and STI test increasing ever having a Pap test (Douglas, Deacon, & Mooney-Somers, 2015). Notably, Agénor and colleagues (2017) had a sample with comparably high rates of Pap testing (73.8%-81.6% for lesbian and bisexual women) to the present study (79.3%), while the studies with positive associations between STI testing and Pap testing (Douglas, Deacon, & Mooney-Somers, 2015; Agénor, Krieger, Austin, Hanuese, & Gottlieb, 2014a) had samples with lower screening rates (68-72%). Additionally, the sample of SMW in the present study had much higher rates of lifetime STI testing (57.9%) than past research. Agénor and colleagues (2017) also had a sample that demonstrated higher rates of past-year STI testing (23.8-40.4%) than their previous study that found positive association between SRH use and screening (15.9%; Agénor, Krieger, Austin, Hanuese, & Gottlieb, 2014a). Additionally, over 73.4% of Agénor and colleagues' (2017) sample reported lifetime sexual contact with men, which is higher than the present sample's rate of 62.8%. However, as many SMW have reported past sexual contact with cisgender men (as high as 77.3%; Diamant et al., 1999), and only half of the present study's sample was currently partnered with a cisgender man, this null association is unlikely to be only explained by sexual partnership variables. As such, there may be shared psychological characteristics between samples of SMW with high rates of SRH usage that in turn influences Pap testing. As the participant demographic characteristics between these two samples

were similar in terms of age, race/ethnicity, education, insurance, relationship status, employment status, and household income, other constructs are likely relevant in determining why certain samples of SMW are high SRH users, and what factors specifically predict Pap testing within them. Psychological theory, in particular, may be useful in identifying norms or risk perceptions that may be characteristic of both STI/D testing and Pap testing in samples of SMW.

The null finding between Internet HISB and Pap testing in SMW indicates that frequently using the Internet to search for sexual health information or information on healthcare providers may not be associated with Pap testing. As previous research has pointed to knowledge of general cervical cancer risk factors as having no bearing on Pap testing behaviors (Tracy, Lydecker, & Ireland, 2010; Tracy, Schluterman, & Greenberg, 2013), Internet HISB may be acting as an indicator of knowledge (which was not assessed in the present study). Alternatively, frequency of other forms of HISB was not assessed in the present study, and instead may be predictive of Pap testing in SMW. Importantly, the item used to assess Internet HISB frequency simultaneously assessed its use for *both* purposes of sexual health information and searching for providers, and thus may not have specifically reflected participants' use of the Internet for *only* cervical cancer screening information. Similarly, this item did not specify whether or not an individual used the Internet to search for information on cervical cancer or Pap testing, and thus its nonsignificance does not entirely preclude an association between Internet HISB and Pap testing. As with other health indicators and outcomes in the present study, SMW, on average, reported fairly frequent use of the Internet for HISB in the past year (71%). This high rate is comparable to both previous mixed-methods research studies on rates of Internet HISB for purposes of sexual health in SMW (75%; Magee, Bigelow, DeHaan, & Mustanski, 2012) and

rates of nonspecific health information use in the general U.S. population (72%, Fox and Duggan, 2013). Further, previous research also points to the quality of online sexual health resources for SMW lacking in quality and interpretability (Lindley, Friedman, & Struble, 2012; Faulkner & Lannutti, 2016). Thus, it is not surprising that the sole act of searching for sexual health information online is not associated with a specific sexual health behavior (Pap testing).

Social and community constructs. First, a series of chi-square, Pearson's product moment correlation, and independent samples t-test analyses were conducted to test for associations between social and community constructs and Pap testing outcomes. At the bivariate level, sexual orientation disclosure to an SRH provider and better provider communication quality were positively associated with both routine screening and future screening intention outcomes. Alternatively, sexual orientation disclosure to a PCP or SRH provider, greater quality provider communication, and greater provider trust was also associated with higher future screening intention. At the multivariate level, many associations fell to nonsignificance. Within the logistic regression model, only greater provider communication quality was associated with increased odds of being a routine screener. Within the multiple regression model, only greater provider trust was associated with higher future screening intention.

Sexual orientation disclosure being significantly and positively associated with Pap testing outcomes at the bivariate level is congruent with past research on SMW and sexual orientation disclosure (Tracy, Schluterman, & Greenberg, 2013; Johnson, Mueller, Eliason, Stuart, & Nemeth, 2016; Douglas, Deacon, & Mooney-Somers, 2015; Mor et al., 2015). Additionally, qualitative (Johnson, Nemeth, Meuller, Eliason, & Stuart, 2016) and mixed methods (Darwin & Campbell, 2009) research has pointed to SMW feeling concerned about negative repercussions of disclosing their sexual orientation to providers as a barrier to

screening. Further, sexual orientation disclosure, which was originally a significant bivariate correlate, fell to nonsignificance in multivariate models that included patient-provider communication quality and trust. Though this may be due to a power issue, it may also be explained by SMW's concerns of discomfort or mistrust as a barrier to sexual orientation disclosure (and subsequent Pap testing). It follows, then, that the quality of SMW's encounters with providers significantly contributes to the overall likelihood of Pap testing (or of having increased screening intentions) even when sexual orientation disclosure is accounted for, and that sexual orientation disclosure itself may act as an indicator of the quality of past or current patient-provider relationships.

Additionally, the finding that patient-provider communication quality is positively associated with Pap testing is an important addition to the larger literature base on SMW, provider recommendation, and Pap testing. Past research on patient-provider relationships in SMW has been limited. The majority of previous studies on SMW, patient-provider communication, and Pap testing have examined the relationship between the receipt of provider recommendations and Pap testing compliance. Of these, receipt of provider recommendation tends to greatly increase the likelihood of routine testing (Tracy, Schluterman, & Greenberg, 2013; Johnson, Mueller, Eliason, Stuart, & Nemeth, 2016) for white SMW, but not African American SMW (Matthews et al., 2013). Additionally, research on the general population has found that provider recommendation does not fully explain cervical cancer screening patterns (Peterson et al., 2016). As the patient-provider communication scale used in the present study specifically assessed the frequency and quality of provider recommendations about cervical cancer screening, it stands to reason that recommendation alone is not always enough to increase odds of Pap testing for certain SMW. As SMW who are "out" to providers have greater

satisfaction with care and comfort discussing sexual health with providers (Mosack, Brouwer, & Petroll, 2013), it is likely there is an interaction between sexual orientation disclosure and patient-provider communication. This is the first study to examine aspects of provider communication quality related to cervical cancer screening in a sample of SMW, and is in line with research from the general population that found a positive association between patient-provider communication and likelihood of cervical cancer screening (Politi, Clark, Rogers, McGarry, & Sciamanna, 2008; Peterson et al., 2016).

Finally, the overall scale mean for provider communication quality was in the middle of the possible range, which indicates provider communication about cervical cancer screening (or its recommendation) in this sample may not have been perceived as competent by all SMW. Future research should investigate specific factors that improve patient-provider communication in SMW samples. Within the qualitative cervical cancer literature, SMW have expressed preference for providers with shared demographic characteristics (e.g., African American providers for African American SMW in Agénor, Bailey, Krieger, Austin, & Gottlieb, 2015; female practitioners in Darwin & Campbell, 2009, Curmi, Peters, & Salamonson, 2014), and these qualities should be tested within quantitative research paradigms.

Further, as provider trust was also significantly associated with Pap testing intention at both the bivariate level and multivariate level (and, again, the regression model's effect size was large), trust in providers is clearly associated with SMW acting on the information they receive from healthcare providers. Again, this is in line from findings from the general literature that show receipt of recommendation to screen needs to be augmented by other health communication factors (Peterson et al., 2016). These findings may also explain Matthews' and colleagues null finding between provider recommendation and Pap testing in a sample of African

American SMW, as this is a population that is likely to have greatly reduced trust in providers. Overall, it is apparent that provider communication quality about cervical cancer screening and one's trust in providers is an important motivator of screening in SMW, and more research should be conducted that examines factors that predict increased provider trust and communication quality in SMW and SMW subpopulations. Future research should seek to more directly examine this connection, particularly through observational paradigms that examine patient-provider interactions within different medical contexts.

Psychological constructs. At the bivariate level, eHealth literacy was positively associated with increased screening intention, such that individuals who had better perceptions about their eHealth literacy had higher future screening intention. After including demographic factors, this association remained significant at the multivariate level. This finding is in contrast to the previous null relationship between Internet HISB and Pap testing, and provides support in the direction of SMW's ability to use low quality health information sources. As low-quality resources tend to be prevalent online (Faulkner & Lanutti, 2016; Lindley, Friedman, & Struble, 2012), this may also indicate that locating quality sources is an important ability in predicting Pap testing intentions. Practically, these combined findings may indicate that greater health information access is needed in the area of SMW sexual health. Additionally, as a large percent of SMW (71%) reported use of the Internet in the past year to search for sexual health information or providers, the lack of relationship between overall frequency of Internet HISB and Pap testing does not reflect low Internet HISB rates in the sample. Instead, and in context with the positive association between eHealth literacy and Pap testing intentions, this may reflect lack of access or exposure to relevant and/or high quality sexual health resources for SMW, which is a theme reflected throughout qualitative literature on SMW's online sexual health

information (Faulkner & Lanutti, 2016; Lindley, Friedman, & Struble, 2012). Overall, this finding suggests that there is a need to study the quality of SMW's cervical cancer resources on the Internet and to further see if access and resource quality is predictive of Pap testing behaviors.

Biological constructs. Finally, a series of chi-square and independent samples t-test analyses were conducted to test for associations between biological constructs and Pap testing outcomes. At the bivariate level, ever having an abnormal Pap test result was associated with both increased odds of being a routine screener and greater future screening intention. At the multivariate level, this association was no longer significant for the screening intention outcome. Having an abnormal Pap test is typically associated with increased rates of screening in SMW (Johnson, Mueller, Eliason, Stuart, & Nemeth, 2016; Tracy, Schluterman, & Greenberg, 2013), and its lack of significance in the multivariate intention model may indicate that gender expression (which remained significant in the model) poses a barrier to screening regardless of Pap result history. As Johnson and colleagues (2016) found that encountering medical discrimination due to one's gender expression was associated with a decreased likelihood of routine screening, this finding may indicate that gender-based discrimination may prevent high-risk SMW from receiving necessary screenings to prevent cervical cancer. However, Johnson and colleagues' multivariate model included history of abnormal Pap results, which was significantly associated with routine Pap testing. One explanation for this discrepancy may be due to study composition – Johnson and colleagues (2016) included both SMW and transgender men in the same analytical sample, while the present study neither included transgender men nor gender nonbinary individuals who were currently accessing HRT. Thus, the gender-based discrimination endorsed in Johnson and colleagues' sample may be qualitatively different than

the aspects of masculine gender expression that decreased likelihood of screening in the present sample. Thus, care should be taken in future research to further disentangle gender expression, gender identity, and gender-based discrimination in cisgender and transgender samples, and the ways by which these factors differentially predict Pap testing among cisgender women and transgender men with cervixes should also be assessed.

For either outcome, family history of cervical cancer was not significant at either the bivariate or multivariate level, which has been found in past research of SMW (Johnson, Mueller, Eliason, Stuart, & Nemeth, 2016). This null finding may be due to other psychological norms relative to cervical cancer screening (for instance, HPV risk and peer sexual histories) as being more relevant to perceived susceptibility of SMW to cervical cancer than family-based norms. Among qualitative studies, it was noted that peer history of cervical cancer diagnosis tended to weigh more than family member history when those peers were also SMW (Curmi et al., 2014). In this case, the Theory of Planned Behavior (Ajzen, 1991) may be useful in identifying how peer norms about cervical cancer screening act to influence SMW's attitudes toward screening, their own behavioral self-efficacy, and, collectively, Pap testing intentions and screening guideline compliance. Further, specific norms (family, peer, other sexual minority women) should be compared and contrasted in order to examine how different social pathways influence screening intentions in the face of biological pathways like family history of cervical cancer.

Aim 3

Scale descriptives. First, means and standard deviations were examined for each of the medical heterosexism items examined. In the current study sample, on average, providers and office staff had the tendency to assume SMW were heterosexual, and providers often failed to

provide information about sexual/reproductive health risks or ask about sexuality or partner status. Conversely, on average, providers and staff did not tend to make SMW feel uncomfortable for certain services, feel ashamed of their sexuality or behaviors or treat SMW differently or unfairly after disclosing their sexual orientation. Additionally, on average, providers did not tell SMW that they did not need to get a Pap or STI test due to their gender or the gender of their sexual partners, which is an improvement over trends found in older qualitative literature utilizing samples from the 2000's (Curmi, Peters, & Salamonson, 2014; Curmi, Peters, & Salamonson, 2016; Power, McNair, & Carr, 2009). This study is one of the first to quantify perceived medical heterosexism and assess frequency of heterosexist events within medical encounters. As such, it cannot be ascertained as to whether these behaviors are common or uncommon within the context of patient-provider encounters (or patient-staff encounters).

It is important to note, however, that despite frequency (or infrequency) of heterosexist events within medical contexts, encountering medical heterosexism at all may be enough to influence testing intentions. Within the qualitative literature, SMW have described concerns over judgment or discrimination from providers (Darwin & Campbell, 2009; Power, McNair, & Carr, 2009; Johnson, Nemeth, Mueller, Eliason, & Stuart, 2016), assumptions of heterosexuality from providers (Curmi, Peters, & Salamonson, 2016), and being given inaccurate information about their cervical cancer risks (Darwin & Campbell, 2009; Curmi, Peters, & Salamonson, 2014; McIntyre, Szewchuk, & Munro, 2010). Thus, though there may be a very low overall frequency of an occurrence (e.g., being given inaccurate information), receiving that incorrect information once may be enough to discourage healthcare access. Given this aspect of medical heterosexism was not assessed, this relationship cannot be determined from the present study's heterosexism construct (which instead assessed the overall frequency of a variety of heterosexist events from

medical providers and their office staff). However, the presence of these lower-frequency heterosexist encounters should not be diminished as they still represent discriminatory encounters for SMW that should not occur within medical encounters.

From the mean frequencies alone, however, the current study's findings point to medical heterosexism primarily taking the form of inadequate medical forms and assumptions of heterosexuality from both medical providers and their staff, while more direct sexuality-related discrimination or misinformation was not frequently encountered within the study sample. Though not specifically operationalized as medical heterosexism, Johnson and colleagues (2016) also quantitatively examined what certain aspects of the health care environment were encountered by SMW. Overall, it was rare that intake forms included fields for sexual orientation (15.4%) or gender identity (11.7%), which is in line with descriptive findings from the present study. Conversely, environments tended to feel welcoming (63.1%), which is comparable to the finding that SMW infrequently felt uncomfortable at practices in the present study. Discrimination based on sexual orientation was also less common (26.6%) in Johnson and colleagues' (2016) study. Collectively, findings suggest that in more recent years, overt discrimination or misinformation may be becoming more infrequent, though these quantitative findings cannot be directly compared to past qualitative research. Descriptive data on medical heterosexism should continue to be collected and appraised across regions and over time, as regional (Baldwin, Dodge, Schick, Sanders, & Fortenberry, 2017) and history (McIntyre, Szewchuk, & Munro, 2010) factors are likely to influence both forms and rates of medical heterosexism. Additionally, policy-level factors that influence healthcare discrimination frequency should also be assessed, as past research has found structural discrimination (i.e., lack

of state-level nondiscrimination protections) to be associated with greater satisfaction with care and likelihood of sexual orientation disclosure (Baldwin et al., 2017).

Mediational hypothesis. Next, this potential association between perceived medical heterosexism and Pap testing intention was tested within the following multiple mediation model: it was hypothesized that provider trust and provider communication quality would simultaneously mediate the relationship between perceived medical heterosexism and Pap testing intention. Perceived medical heterosexism was not directly associated with Pap testing intention. However, it was significantly and inversely associated with both provider trust and provider communication quality, such that increased medical heterosexism was associated with decreased provider trust and communication quality. In turn, both provider trust and provider communication quality were significantly and positively associated with Pap testing intention, such that greater quality provider communication and trust was associated with higher Pap testing intention. Finally, the total indirect effect between medical heterosexism through provider communication quality and provider trust to Pap testing intention was significant. As the direct effect was not significant and the total indirect effect was significant, this means there was a mediation effect present. In other words, though perceived medical heterosexism did not directly influence Pap testing intention, it did influence intention through its influence on lower provider trust and communication quality.

A second mediation model was run for the routine Pap testing outcome, and this model found that provider communication quality mediated the relationship between medical heterosexism and routine Pap testing: greater perceived medical heterosexism was associated with poorer provider communication quality, and this total indirect effect was associated with a decreased likelihood of being a routine screener. Thus, similar to the model with Pap testing

intention as the outcome, medical heterosexism works to inhibit perceived provider communication quality about cervical cancer screening, which in turn is associated with decreased likelihood of being a routine screener. It should be noted that due to the cross-sectional nature of the study, there is no precedence for causality and these pathways only represent associations.

This finding is novel, as this is the first study to not only quantitatively examine several facets of medical heterosexism simultaneously, but to also look at the mediational influence of communication factors on the relationship between heterosexist discrimination and cervical cancer screening. Previously, medical heterosexism has been linked to decreased quality of patient-provider communication and frequency of gynecological service utilization in lesbian women (DeHart, 2008), which is similar to the present study's mediation models. This finding is also in line with Johnson and colleagues' study (2016), who found that feeling unwelcome, feeling a partner is unwelcome, or feeling discriminated against due to one's sexual orientation were each associated with being a nonroutine screener. Tracy, Lydecker, and Ireland (2010) had a similar finding, where both perceived general discrimination in healthcare encounters and avoidance of care due to fears of discrimination due to sexual orientation was associated with a decreased likelihood of routine screening.

As medical heterosexism was not directly associated with Pap testing intention or likelihood of routine screening and instead with communication factors in the indirect paths of the mediation models, this indicates that medical heterosexism acts as a barrier to care due to its influence on health communication factors. Reduced trust is likely to have a negative impact on healthcare utilization factors (Mainous, Baker, Love, Pereira Gray, & Gill, 2001; Musa, Schulz, Harris, Silverman, & Thomas, 2009), which in turn may reduce SMW's likelihood of receiving

SRH services or acting on provider referrals for cervical cancer screening. Additionally, as medical heterosexism was also associated with poorer provider communication quality regarding the overall cervical cancer screening process, SMW who do go to SRH providers may not be receiving sufficient information to in turn motivate future screening behavior. The primary implication of this model is the influence of medical heterosexism on health communication pathways that, theoretically, should improve screening likelihood (Peterson et al., 2016; Musa et al., 2009). As patient-provider relationships are critical for the regular receipt of preventive health services like cervical cancer screening (Peterson et al., 2016), improving LGBTQ-inclusivity of healthcare environments is necessary to improve rates of cervical cancer screening in SMW. Further, recommendations for screenings should be explicit in their applicability to all persons with cervixes (Peitzmeier, 2013), and providers should be trained to provide adequate communication and consultation to sexual and gender minority individuals about cervical cancer screening.

Exploratory analyses. Several exploratory analyses were conducted between perceived medical heterosexism and other HEPM factors. First, SMW who were out to a PCP perceived lower levels of medical heterosexism than those who were not out to a PCP. This is in line with the finding that LGBT individuals in states lacking nondiscrimination legislation were less likely to disclose their sexual orientation to providers (Baldwin, Dodge, Schick, Sanders, & Fortenberry, 2017). However, level of perceived medical heterosexism did not differ by whether or not SMW disclosed their sexual orientation to an SRH provider, which may indicate SMW accessing these services already navigated medical heterosexism successfully to reach this point. Regardless, perceived medical heterosexism (or systemic factors, like absence of state-level nondiscrimination policy) is related to sexual orientation disclosure, and likely acts as a barrier to

cervical cancer screening in certain populations of SMW. Again, it should be noted that a great deal of the heterosexism perceived by the sample was endorsed in the form of inadequate intake forms and discomfort with providers, which indicates that more surreptitious forms of heterosexism (e.g., not direct discrimination or misinformation) can still influence communication factors for SMW.

Perceived levels of heterosexism did not differ by gender, gender expression, or sexual orientation in the current sample. As within Aim 2, Pap testing outcomes did not differ by sexual orientation, this finding is ultimately not surprising, though should be reproduced in other samples who may have more diverse experiences of medical heterosexism (or diverse participant demographics). Additionally, the present study's questionnaire did not examine whether or not an individual experienced discrimination due to their gender expression, which may be more relevant to individuals with masculine gender expression. Johnson and colleagues (2016) found that SMW and transgender men who felt discriminated against due to their gender expression were less likely to be routine screeners. Thus, medical heterosexism may work in tandem with gender discrimination (and/or anti-transgender discrimination, when relevant) to influence screening outcomes, and future hypotheses should test such intersectional relationships.

Aim 4

Type of primary care. First, it was hypothesized that type of PCP (women's health center, student health center, community health center, private practitioner) would differentially predict social and community factors (provider communication quality, provider trust). Type of primary care was not associated with provider communication quality, but it was associated with provider trust. A post hoc analysis revealed that SMW whose PCP was a private practitioner had significantly greater trust in their provider than those whose PCP came from a community health

center. These findings are largely exploratory, as trust in providers and its correlates have not been widely studied in samples of SMW. However, this finding indicates that SMW who have access to private practitioners have better relationships with their providers than SMW who access community health centers. As provider trust was previously associated with increased Pap testing intention, access to private practitioners may improve health communication pathways for SMW that benefit Pap test motivations. In light of qualitative research where SMW describe preferring women's health centers in order to avoid provider discrimination (Curmi, Peters, & Salamonson, 2014), this may indicate that quality of private practitioners are better than that of community health centers in the present sample, or that other health care utilization factors relevant to SMW systematically differ between these types of practices and should be investigated in future research.

Mediation model. Finally, it was hypothesized that Internet HISB would mediate the relationship between eHealth literacy and Pap testing intention. eHealth literacy was positively associated with Pap testing intention, such that as perceived eHealth literacy increased, Pap testing intention also increased. Similarly, eHealth literacy was also positively associated with Internet HISB: as perceived eHealth literacy increased, frequency of Internet HISB also increased. However, Internet HISB was not associated with Pap testing intention, which means it does not mediate the relationship between eHealth literacy and Pap testing intention.

As only perceived eHealth literacy was assessed (and not actual eHealth literacy), conclusions that can be drawn from these data are limited. Additionally, quality of Internet health information resources was not assessed, and instead only the frequency of Internet HISB was examined. As such, this model indicates that more positive perceptions of one's eHealth literacy is associated with increased Internet HISB in SMW, which is in line with findings from the

colorectal cancer screening literature from the general population (Mitsutake, Shibata, Ishii, & Oka, 2012). Additionally, and as seen in the previous Aim 2 regression model, more positive perceptions of eHealth literacy were associated with increased screening intentions. This finding is in contrast to the null relationship between Internet HISB and screening outcomes, which may indicate that another aspect of Internet health information usage is associated with screening intentions (which was not assessed in the HISB questions in the present study). However, since only frequency of Internet HISB was assessed, conclusions cannot be drawn about whether use of high-quality Internet sources are associated with increased screening odds. Additionally, overall sexual health literacy was not assessed, which has been previously associated with Internet health information usage (Lam & Lam, 2012).

Overall, this finding is not surprising given past null associations between cervical cancer knowledge and routine screening behavior (Tracy, Lydecker, & Ireland, 2010; Tracy, Schluterman, & Greenberg, 2013). In context with the broader literature, it is apparent that regardless of a SMW's cervical cancer knowledge or Internet HISB, other health communication factors contribute to screening intentions and status. Given the present study's findings related to the roles of provider trust and communication quality in predicting cervical cancer screening outcomes, and further how provider trust differs by provider type, attention should be paid to how SMW locate competent providers. Additionally, the quality of accessed Internet health information (and not only the frequency of searching) should also be assessed in future research. As greater eHealth literacy was associated with increased screening intentions, some aspect of online sexual health information utilization or exposure may be related to cervical cancer screenings. Alternatively, a third variable (like greater health orientation) may explain both greater levels of Health literacy and Pap testing rates. Thus, the qualities of these resources

should be disentangled from history or frequency of Internet HISB alone. Qualitative research largely points to the use of the Internet by SMW as a strategy for augmenting their healthcare (Flanders, Pragg, Dobinson, & Logie, 2017; Polonijo & Hollister, 2011). Thus, the manner by which different Internet resources are accessed, their influence on health motivations, and their relationship to the accuracy and accessibility of these resources should be assessed.

Implications

This study holds several implications regarding SMW's Pap test utilization and its correlates. Primarily, medical heterosexism plays an important role in minimizing significant health communication facilitators of cervical cancer screening for SMW. The identification of health communication factors as facilitators of screening for SMW is also novel. Past studies which have included aspects of patient-provider communication in the context of cervical cancer screening behaviors have primarily focused on the receipt of provider recommendation for Pap testing (Tracy, Lydecker, & Ireland, 2010; Tracy, Schluterman, & Greenberg, 2013; Johnson, Mueller, Eliason, Stuart, & Nemeth, 2016). The present study extends these findings by identifying specific health communication factors that are associated with increased screening odds (or intention).

Provider education and practice policy should seek to create affirming spaces for SMW within both PCP and SRH practices, which should in turn assist providers to build better relationships with SMW and overall increase cervical cancer screening. As nondiscrimination policy has been linked to other health communication factors, like sexual orientation disclosure (Baldwin, Dodge, Schick, Sanders, & Fortenberry, 2017), enactment of nondiscrimination policy at a practice-level may also be efficacious in improving patient-provider relationships for SMW. Future research should also seek to investigate how nondiscrimination policy and provider

education (e.g., continuing education credits, medical school coursework) are associated with both medical heterosexism and health communication factors for SMW.

SRH service access also acted as a facilitator for cervical cancer screening in SMW. Specifically, lifetime HIV testing, HPV vaccination completion, and birth control consultation were associated with an increased Pap testing intentions and/or likelihood of routine screening. Implications are twofold. First, in the case of HIV testing and HPV vaccination completion, both services should be specifically targeted toward SMW in sexual health messaging campaigns. Conversely, since both HIV testing and HPV vaccination completion were accessed more infrequently than Pap testing in this sample, it can also be argued that access to cervical cancer screening resources can bolster access to less frequently utilized SRH services by SMW. Second, and as suggested by Agénor and colleagues (2014), alternate pathways for getting Pap testing recommendations should be improved (i.e., PCPs should have knowledge of the sexual health needs of SMW).

Finally, certain social identity positions, including access to care, insurance access, and masculine gender expression, present as barriers to cervical cancer screening. As socioeconomic status has accounted for cervical cancer screening disparities in population-level samples of bisexual women (i.e., inclusion of SES factors in models resulted in other health-related factors dropping to nonsignificance; Solazzo, Gorman, & Denney, 2017), bisexual women may be most affected by these access barriers. As the current sample was largely composed of bisexual, pansexual, queer, and behaviorally bisexual women, it is clear that socioeconomic factors can act as a barrier to routine screening in this population. Additionally, the finding of masculine gender expression acting as a barrier to screening is comparable to Johnson and colleagues' (2016) finding that SMW and transgender men who experienced discrimination due to gender

expression are less likely to be routine screeners. Collectively, these findings regarding gender expression indicate that experiences of discrimination and heterosexism are not uniformly experienced by SMW, and care should be taken to investigate the role of gender expression in negative patient-provider encounters.

Limitations & Future Directions

First, the study used a one-time cross-sectional design, thus causal inferences cannot be made about the relationships seen in the data. Future longitudinal studies are needed to see how factors correlate with Pap testing over time. Additionally, experimental designs could also be used to examine the effects of provider training on communication outcomes with SMW. Second, sub-categories of certain demographics, like sexual orientation and race, were too small in size to allow for the examination of interactions between sub-categories and significant predictors of Pap testing. Future studies with larger samples should seek to understand how certain mechanisms, like eHealth literacy, patient-provider communication, and heterosexism, differ based on identity to predict Pap outcomes. Third, the demographics of the sample are racially and ethnically homogenous, with high levels of education and a large proportion of individuals with cisgender male partners (past or present). Future research should seek to replicate findings with more heterogeneous samples, and should also test interactions by gender and racial groups. Fourth, there are limitations to the accuracy of cancer screening self-report measures (Rauscher, Johnson, Cho, & Walk, 2008), which may have influenced the routine Pap testing outcome. Fifth, only the perceived eHealth literacy of participants was measured and not actual eHealth literacy. Future studies should seek to measure participant's actual eHealth literacy through on-site measurement paradigms. Similarly, only the frequency of Internet HISB was assessed, and the qualities of Internet sexual health information resources for SMW should

be measured in future work. Related to this, how SMW locate trustworthy providers should also be explored. Finally, this study is the first to quantitatively examine multiple aspects of medical heterosexism, including varied aspects of provider and staff discrimination, and findings using such a measure of heterosexism should be replicated before anything can be conclusively said about its role in predicting routine Pap testing.

Conclusion

Overall, the primary finding from this study is the mediational influence of health communication pathways on the relationship between perceived medical heterosexism and Pap testing outcomes. These mediation models suggest that heterosexism is not directly associated with Pap testing and instead is associated with decreased patient-provider relationship quality which in turn influences Pap testing intention and probability. Further, as both ever having an HIV test was associated with routine Pap testing after accounting for social and identity pathways, and both lifetime birth control consultation and completion of the HPV vaccination series were associated with increased Pap testing intention in bivariate analyses, SRH utilization is another pathway by which SMW are more likely to access Pap testing services. Collectively, these findings point to the need for targeted provider education and policy interventions that improve SMW's relationships with their providers as well as diversifies the healthcare mechanisms by which they access Pap testing services. Findings are significant as they are the first to test a mediational framework of health communication and discrimination factors, and this study is the first to examine provider communication, trust, and eHealth literacy in a cervical cancer context for SMW.

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Appendix A

Demographics - Screening

In the following section, you will be asked several questions about your age, gender, and sexual orientation in order to determine your eligibility for the full study. This section should take less than a minute to complete.

1. How old are you? ____ years

2. What sex were you assigned at birth on your original birth certificate? (Check one)

__ Male __ Female

3. What is your current gender identity? (Check all that apply)
- __ Male
- __ Female
- __ Female-to-Male (FTM)/Transgender Male/Trans Man
- __ Male-to-Female (MTF)/Transgender Female/Trans Woman
- __ Genderqueer, neither exclusively male nor female
- __ Additional Gender Category/(or Other), please specify: _____

4. Hormone therapy refers to the medical treatment in which a patient receives hormones as supplement to or replacement for naturally occurring hormones. Are you currently receiving hormone therapy for the purpose of gender transition/affirmation?

Yes No

5. Which best describes your sexual orientation? (Mark all that apply)

Heterosexual or straight
Gay or lesbian
Bisexual
Asexual
Queer
Questioning
Other: [PLEASE SPECIFY]

6. Which best describes your previous romantic, sexual, and/or dating partners? (Mark all that apply)

Cisgender Men
Cisgender Women
Transgender Men
Transgender Women
Non-binary and/or gender non-conforming individuals
No previous romantic, sexual, and/or dating relationships
Other: [PLEASE SPECIFY]

7. Which best describes your current romantic, sexual, and/or dating partner(s)? (Mark all that apply)

Cisgender Men
Cisgender Women
Transgender Men
Transgender Women
Non-binary and/or gender non-conforming individuals
No previous romantic, sexual, and/or dating relationships
Other: [PLEASE SPECIFY]

Demographics – Cont. (Not for screening)

8. Which best describes you? Please check all that apply.
_ White/Caucasian
_ African-American/Black
_ Hispanic/Latino/Latina/Latinx
_ Asian American
_ Native American
_ Multiracial/Multiethnic
_ Other: _____

9. A person's appearance, style, or dress may affect the way people think of them. On average, how do you think people would describe your appearance, style, or dress? (Mark one answer)

__Very feminine
__Mostly feminine
__Somewhat feminine
__Equally feminine and masculine
__Somewhat masculine
__Mostly masculine
__Very masculine

10. Which best describes who you are sexually attracted to? (Mark all that apply)

Cisgender Men
Cisgender Women
Transgender Men
Transgender Women
Non-binary and/or gender non-conforming individuals
Not sexually attracted to anyone
Other: [PLEASE SPECIFY]

11. Last year when you did your taxes, what was your household income before taxes?

_ Less than $25,000
_ Between $25,000–$49,999
_ Between $50,000–$99,999
_ $100,000 or more

12. What is your highest level of completed education?

_ Grade school
_ High school/GED
_ Some college (no degree)

_ 2-year/technical degree
_ 4-year college degree
_ Master's degree
_ Doctorate degree/Professional Degree (Ph.D., M.D., J.D., etc.)

13. What type of medical insurance do you have (circle one)?

None Medicaid Other government insurance

Private (from job) Private (through parents) Private (other: _____)

14. Do you have any disability?
Yes No Don't Know

15. Have you ever been diagnosed with a chronic health condition?

Yes No Don't Know

16. Currently, how often do you smoke tobacco?

__ Daily ___ Less Than Daily __Not at All __ Don't Know

17. Currently, how often do you consume alcohol?

__ Daily __ Less Than Daily __Not at All __ Don't Know

18. About how much do you weigh without shoes? _____ pounds

19. About how tall are you without shoes?_____

The next section asks about your health care utilization and history, including Pap testing. In the following section, the terms "Pap test" and "Pap smear test" are used. This refers to a cervical cancer screening test done in a doctor's office or a clinic. During the test, the doctor or nurse uses a plastic or metal instrument, called a speculum, to widen the vagina. This helps the doctor or nurse examine the vagina and the cervix, and collect a few cells and mucus from the cervix and the area around it.

20. When did you have your MOST RECENT Pap test? To the best of your knowledge, please provide the YEAR and MONTH: _____

21. In the past 3 years, have you received a Pap test?

Yes No Don't Know

22. An HPV test is sometimes given with the Pap test for cervical cancer screening. Did you have an HPV test with your most recent Pap test? (NHIS, 2015)

Yes No Don't Know

Within your lifetime, have you…

23. Received a Pap test?	Yes	No	Don't Know
24. Had a human immunodeficiency virus (HIV)	Yes	No	Don't Know

test?

25. Received counseling or testing for a sexually transmitted infection? Yes No Don't Know

26. Seen a provider for a form of hormonal contraception, such as a birth control prescription or intrauterine device/IUD? Yes No Don't Know

27a. Within your lifetime, how many HPV vaccination shots have you received?

None One Two Three Don't Know

[If answer to 27a is anything other than "None" or "Don't Know"]
27b.To the best of your knowledge, how old were you (in years) when you received your first HPV shot?
_____

In the past 12 months, have you…

28. Seen a primary care physician? Yes No Don't Know

29. Seen an obstetrician-gynecologist (OBGYN)? Yes No Don't Know

30. Has a health care provider ever recommended you receive a Pap test?

Yes No Don't know

31. Have you ever had an abnormal Pap test result?

Yes No Don't know

32. Has anyone in your family been diagnosed with cervical cancer?

Yes No Don't know

33. Do you have a health care center or doctor from who you regularly receive care?

Yes No Don't Know

34. If you do have a regular source of care, what type of source is it? (Check one)

__ Private practitioner
__ Community health center
__ Student health center
__ Women's health clinic

35. Have you told your health care provider (the one you see most often) about your sexual orientation? (Check one)

__ Yes, I volunteered the information without being asked.
__ Yes, but only after she or he asked me.
__ No, but I would tell if she or he asked.
__ No, but I assume she or he knows.
__ No, I would not tell even if she or he asked.
__ I do not have a health care provider.

36. Have you told a health care provider who provides sexual and reproductive health services about your sexual orientation? (Check one)

__ Yes, I volunteered the information without being asked.
__ Yes, but only after she or he asked me.
__ No, but I would tell if she or he asked.
__ No, but I assume she or he knows.
__ No, I would not tell even if she or he asked.
__ I have never seen this type of health care provider.

eHealth Literacy Scale

I would like to ask you for your opinion and about your experience using the Internet for health information. For each statement, tell me which response best reflects your opinion and experience *right now*.

	Not at all true	Somewhat untrue	Neither true nor untrue	Somewhat true	Very much true
1. I know **what** health resources are available on the Internet	1	2	3	4	5
2. I know **where** to find helpful health resources on the Internet	1	2	3	4	5
3. I know **how** to find helpful health resources on the Internet	1	2	3	4	5
4. I know **how to use** the Internet to answer my questions about health	1	2	3	4	5
5. I know how to use **the health information** I find on the Internet to help me	1	2	3	4	5
6. I have the skills I need to **evaluate** the health resources I find on the Internet	1	2	3	4	5
7. I can tell **high quality** health resources from **low quality** health resources on the Internet	1	2	3	4	5
8. I feel **confident** in using information from the Internet to make health decisions	1	2	3	4	5

Health Information Seeking Behavior

In the past twelve months, have you used the Internet to search for sexual health information?

__Yes __No

	Never	Rarely	Sometimes	Often	Always
How often have you used the Internet to search for information about health care providers or sexual health information?	1	2	3	4	5

Which of the following serves as your main source of sexual health information? (Check one)

__ Family members
__ Friends
__ School
__ Healthcare providers
__ Websites – if so, list which one: _____
__ Social media sites – if so, list which one: _____
__ Dating sites/ dating applications – if so, list which one: _____

Patient-Provider Communication

In the following questions, cervical cancer screening refers to Pap tests with or without HPV co-testing.

How often did doctors or health professionals…

	Never	Rarely	Sometimes	Often	Always
1. Really find out what your concerns were about cervical cancer?	1	2	3	4	5
2. Clearly explain their advice and recommendations about cervical cancer screening?	1	2	3	4	5
3. Clearly explain the procedure of cervical cancer screening?	1	2	3	4	5
4. Ask if you were having problems following their advice and recommendations about cervical cancer screening?	1	2	3	4	5

Perceived Heterosexism

How often did **doctors** or **health professionals**…

	Never	Rarely	Sometimes	Often	Always
1. Assume you are heterosexual	1	2	3	4	5
2. Treat you differently or unfairly after disclosing your sexual orientation	1	2	3	4	5
3. Fail to ask about your sexual orientation during appointments or on intake forms	1	2	3	4	5
4. Fail to provide information about your sexual or reproductive health risks	1	2	3	4	5
5. Failed to ask you about your sexuality or partner status	1	2	3	4	5
6. Failed to ask you about your sexual behavior	1	2	3	4	5
7. Made you feel uncomfortable or ashamed of your sexual identity and/or behaviors	1	2	3	4	5
8. Made you feel uncomfortable asking for certain health services	1	2	3	4	5
9. Tell you that you did not need a Pap test due to your sexual orientation or the gender of your sexual partners	1	2	3	4	5
10. Tell you that you did not need to get tested for STIs due to your sexual orientation or the gender of your sexual partners	1	2	3	4	5

How often did **office staff** at a doctor or health professional's office…

	Never	Rarely	Sometimes	Often	Always
1. Assume you are heterosexual	1	2	3	4	5
2. Treat you differently or unfairly after disclosing your sexual orientation	1	2	3	4	5

Trust in Providers Scale

	Strongly disagree	Disagree	Neither agree nor disagree	Agree	Strongly Agree
1. I doubt that my doctor really cares about me as a person	1	2	3	4	5
2. My doctor is usually considerate of my needs and puts them first	1	2	3	4	5
3. I trust my doctor so much, I always try to follow their advice	1	2	3	4	5
4. If my doctor tells me something is so, then it must be true	1	2	3	4	5
5. I sometimes distrust my doctor's opinion and would like a second one	1	2	3	4	5
6. I trust my doctor's judgments about my medical care	1	2	3	4	5
7. I feel my doctor does not do everything they should for my medical care	1	2	3	4	5
8. I trust my doctor to put my medical needs above all other considerations when treating my medical problems	1	2	3	4	5
9. My doctor is a real expert in taking care of medical problems like mine	1	2	3	4	5
10. I trust my doctor to tell me if a mistake was made in my treatment	1	2	3	4	5
11. I sometimes worry that my doctor may not keep the information we discuss totally private	1	2	3	4	5

Access to Care (Cunningham et al., 1995)

You are going to read some statement about the past 12 months. Please select whether you strongly agree, somewhat agree, are uncertain, somewhat disagree, or strongly disagree with each statement.

Would you say…

	Strongly Agree	Somewhat Agree	Uncertain	Somewhat Disagree	Strongly Disagree
1. Sometimes I go without the medical care I need because it is too expensive.	1	2	3	4	5
2. Places where I can get medical care are very conveniently located.	1	2	3	4	5

Intention

	Very unlikely				Very likely
1. How likely are you to get a Pap test within the next three years?	1	2	3	4	5
2. How likely are you to disclose your sexual orientation to a doctor or health care professional who provides sexual health services?	1	2	3	4	5

Vita

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