

Individual- and Partnership-Level Correlates of Protective Barrier Use in a Sample of Transmasculine Adults with Diverse Sexual Partnerships

David R. Pletta, MPH,¹ Jaclyn M. White Hughto, PhD, MPH,¹⁻³ Sarah Peitzmeier, PhD, MSPH,⁴ Madeline B. Deutsch, MD, MPH,⁵ Dana Pardee, BS,¹ Jennifer Potter, MD,^{1,6,7} and Sari L. Reisner, ScD^{1,8,9}

Abstract

The sexual partnerships of transmasculine adults—who were assigned female at birth and identify on the masculine gender continuum—remain understudied. This includes characteristics of transmasculine adults' sexual partnerships associated with engaging in HIV/sexually transmitted infection (STI) sexual risk behavior. This study examined individual- and partnership-level factors of transmasculine adults' sexual partnerships associated with using a protective barrier during sexual activity. Data came from cross-sectional surveys administered to 141 transmasculine adults. Participants provided demographic and sexual health information for up to three sexual partners from the past 12 months ($n = 259$ partnerships). Generalized estimating equations (GEEs) were used to investigate individual- and partnership-level factors associated with any use of a protective barrier during five sexual behaviors. Transmasculine participants engaged in an array of sexual behaviors with diverse sexual partners. Individual- and partnership-level factors of transmasculine adults' sexual partnerships were associated with their protective barrier use; however, these associations varied in statistical significance across the five sexual behaviors. At the individual level, younger participants had lower odds of protective barrier use during fingering or fisting. At the partnership level, protective barrier use was associated with a sexual partnership's configuration and the gender identity of a sexual partner. Relative to participants with cisgender female partners, those with cisgender male partners generally had lower odds of using a protective barrier. Study findings highlight the importance of studying factors associated with HIV/STI risk behavior located beyond the individual. These findings may have implications for improving measurements of HIV/STI-related risk for transmasculine adults.

Keywords: transmasculine, barrier use, condoms, HIV/STIs, sexual partnerships

Introduction

THE SEXUAL PARTNERING and sexual risk behaviors of transmasculine adults remain understudied.^{1,2} Transmasculine adults—who were assigned female at birth (AFAB) and identify on the masculine gender continuum (e.g., male, trans male, genderqueer)³—are often presumed

to have cisgender (nontransgender) female sex partners and to be at low risk for HIV and other sexually transmitted infections (STIs).¹⁻⁵ However, in a recent systematic review and meta-analysis, researchers estimated 24.5% of transmen in the United States had some form of unprotected sexual intercourse, and 19.5% had an HIV-positive or unknown-HIV/STI-status sexual partner within their lifetime.⁶

¹The Fenway Institute, Fenway Health, Boston, Massachusetts.

²Department of Behavioral and Social Sciences, Brown University School of Public Health, Providence, Rhode Island.

³Department of Epidemiology, Brown University School of Public Health, Providence, Rhode Island.

⁴Department of Health Behavior and Biological Sciences, Center for Sexuality and Health Disparities, University of Michigan School of Nursing, Ann Arbor, Michigan.

⁵Department of Family and Community Medicine, University of California, San Francisco, San Francisco, California.

⁶Department of Medicine, Harvard Medical School, Boston, Massachusetts.

⁷Department of General Internal Medicine, Department of Medicine, Beth Israel Deaconess Medical Center, Boston, Massachusetts.

⁸Division of Endocrinology, Diabetes, and Hypertension, Brigham and Women's Hospital, Boston, Massachusetts.

⁹Department of Epidemiology, Harvard T.H. Chan School of Public Health, Boston, Massachusetts.

Burgeoning research on the diversity of transmasculine adults' sexual partnerships and sexual behaviors depicts transmasculine adults engaging in a range of sexual behaviors with both cisgender and transgender partners, including oral, anal, and genital sex.⁷⁻⁹ Despite expanding recognition of transmasculine people's diverse sexual behaviors and sexual partnerships, further research is needed on how characteristics of transmasculine individuals and their sexual partnerships are associated with HIV/STI-related sexual risk behavior.¹

At the individual level, the age of transmasculine adults and their desire to affirm their gender identity may be associated with their engagement in HIV/STI-related sexual risk behavior. One study with female-to-male (FTM) transgender participants found a negative relationship between a participant's age and their odds of having used a protective barrier during their last sexual encounter, with a decrease of roughly 6% per year.¹⁰ Transmasculine adults' sexual behaviors and attractions may also shift over time with changes to their physical body or gendered role in a sexual partnership,¹¹⁻¹³ which can lead to changes in their sexual risk taking.¹³ Psychological experiences of gender dysphoria—or distress from having a gender identity discrepant from one's assigned sex at birth¹⁴—may also influence their sexual behaviors. While some transmasculine people avoid sexual behaviors that can produce feelings of gender dysphoria (e.g., receptive genital sex),⁸ others engage in creative sexual practices to embody their affirmed gender identity during sex—including the use of toys/prosthetics, renaming body parts, and re-imagining their sexual body.¹²

At the partnership level, the configuration of a sexual partnership and the gender identities of sexual partners may be associated with transmasculine adults' willingness to engage in sexual risk behavior. One study with transmasculine men who have sex with cisgender men [i.e., transgender men who have sex with men (MSM)] reported that participants engaged in complex decision-making processes regarding the use of protective barriers during sex.⁵ TMSM participants weighed the perceived HIV/STI risk attributable to sexual behaviors, as well as the configuration of the sexual partnership (e.g., casual hookup, long-term relationship), before deciding whether a protective barrier should be used.⁵ In other studies, TMSM reported a willingness to prioritize their sexual desirability to a cisgender male partner over their use of a protective barrier during sex,¹¹ as sex with a cisgender man further affirmed their male identity.^{9,15} While these studies contribute insights into the sexual partnering and decision-making processes of a subset of the transmasculine community, further research is needed with both TMSM and transmasculine adults of various sexual identities to fully contextualize the complexities of transmasculine adults' sexual health.^{1,2,7,15,16}

The primary objective of the current analysis is to assess individual- and partnership-level factors associated with protective barrier use in a sample of transmasculine adults with diverse sexual partnerships. Participants' odds of using a protective barrier while engaging in five specific sexual behaviors were examined using demographic data from the transmasculine participant, their sexual partner, and the sexual partnership dyad. Findings and their implications for future research and the development of public health interventions tailored to the sexual health needs of transmasculine people and their sexual partners are discussed.

Methods

Participants and procedures

Data for this secondary analysis are drawn from a biobehavioral study on the acceptability and feasibility of self-swab Pap testing among transmasculine adults receiving care at a community health center in Boston, Massachusetts.⁴ Between March 2015 and September 2016, a sample of transmasculine adults ($n=150$) completed cross-sectional surveys with questions regarding their demographics, sexual behavior, protective barrier use, and sexual partnerships. Those who provided sexual health data for at least one sexual partner from the past 12 months were included in this analysis ($n=141/150$). Participants were recruited through multiple convenience sampling methods (e.g., peer recruitment, posting flyers). Eligibility criteria consisted of: (1) assigned a female sex at birth and identifying with a gender along the masculine spectrum; (2) ages 21–64 years (inclusive); (3) have a cervix; (4) sexually active within the past 3 years; (5) able to speak and understand English; (6) willing and able to provide informed consent. The study received Institutional Review Board approval (#FWA00000145). Additional information regarding the primary study is published elsewhere.⁴

Measures

Table 1 displays specific measures, items, and variable coding for both descriptive and modeling purposes. In the current analysis, the primary outcome was participants' odds of using a protective barrier while engaging in five sexual behaviors. The Trans Masculine Sexual Health Assessment (TM-SHA),⁴ an adapted version of the AIDS Risk Behavior Assessment (ARBA),¹⁷ was used to assess the frequency of sexual behavior and protective barrier use. Protective barrier use was operationalized as any use of an external condom, internal condom, dental dam, or another protective barrier during sexual activity. At the individual level, we assessed participant age, race, gender identity, sexual orientation, prior STI diagnoses, and number of sexual partners in the past 12 months. Participants also provided demographic and sexual risk-related data for up to three sexual partnerships within the past 12 months. At the partnership level, we assessed sexual partners' gender identities and the configuration of sexual partnerships. Due to heightened HIV/STI risk among transgender women⁶ and cisgender men (particularly MSM),¹⁸ and to ensure model convergence given the low event rate of the outcome, these groups were consolidated and contrasted to transgender men and cisgender women in Model 5 (i.e., frontal receptive sex with genitals).

Patient and community involvement

The TM-SHA, responsible for gauging sexual behavior and protective barrier use in the current study, was collaboratively developed with a research team comprised of five transmasculine adults and a scientific advisory board with five experts in transgender health and transgender health research. These community members played a vital role in assuring our instruments were gender affirming, respectful, and reflective of the sexual lives of transmasculine adults.

TABLE 1. MEASURES, ITEMS, AND CODING SCHEME FOR DESCRIPTIVE STATISTICS AND GENERALIZED ESTIMATING EQUATIONS

<i>Level</i>	<i>Measure</i>	<i>Question</i>	<i>Response options</i>	<i>Coding for descriptive statistics</i>	<i>Coding for GEEs</i>
Outcome	Sexual behavior and protective barrier use	“For the following questions, please identify whether or not you engaged in any of the following sexual activities in the last 12 months with this partner. If you respond ‘Yes’, please specify how often a barrier was used.”	Sexual behavior (yes/no): (1) Performing frontal and/or anal penetration with a finger/fist; (2) Receiving frontal and/or anal penetration with a finger/fist; (3) Performing oral-genital sex; (4) Receiving oral-genital sex; and (5) Frontal receptive sex with genitals. Protective barrier use: (1) Never; (2) Less than half the time; (3) About half the time; (4) More than half the time; (5) Always	Frequency of sexual partnerships in which the sexual behavior occurred (yes/no) by any use of a protective barrier (“never used a barrier,” “any use of a protective barrier”)	Modeled outcome: For each sexual behavior, protective barrier use was coded as either: (0) engaged in the sexual behavior and never used a protective barrier, or (1) engaged in the sexual behavior and used a protective barrier on at least one occasion
Individual	Age	“What is your age?”	Continuous years	Frequency of age categories: 21–24; 25–29; 30–34; 35–50 years	Models 1–4: Age categories of 21–24; 25–29; 30–50 years Model 5: Continuous years
	Race	“How do you describe your race or ethnic background? Check all that apply.”	(1) White/Caucasian; (2) Black/African American; (3) Asian; (4) American Indian/Alaskan Native; (5) Native Hawaiian or other Pacific Islander; (6) Multiracial; (7) “Another race, please specify”	Frequency of race categories: White/Caucasian; Black/African American; Asian; American Indian/Alaskan Native; Native Hawaiian or other Pacific Islander; and Multiracial	White; Non-white/POC
	Gender identity	“If you had to select ONE response that best describes your current gender identity today for the purposes of a survey, what would it be? Check one.”	(1) Man; (2) Male; (3) Transgender man; (4) FTM; (5) Trans man; (6) Man of transgender experience; (7) Trans masculine; (8) Genderqueer; (9) Gender nonconforming; (10) Nonbinary; (11) Agender; (12) Bigender; (13) “Another gender, please specify”	Frequency of gender identity categories: Man/male; Transgender male (FTM); Genderqueer/nonbinary; and “Another gender”	N/A

(continued)

TABLE 1. (CONTINUED)

<i>Level</i>	<i>Measure</i>	<i>Question</i>	<i>Response options</i>	<i>Coding for descriptive statistics</i>	<i>Coding for GEEs</i>
	Sexual orientation	“Which of the following best describes your sexual identity or orientation today? Choose one.”	(1) Gay/homosexual/same-gender attraction; (2) Straight/heterosexual; (3) Bisexual; (4) Queer; (5) Pansexual; (6) Questioning; (7) Asexual; (8) Unsure; (9) I do not label my sexual orientation; (10) “Another sexual orientation, please specify”	Frequency of sexual orientation categories: Gay/homosexual/same-gender-attraction; Straight/heterosexual; Bisexual; Queer; Pansexual; Questioning/unsure; Asexual; and “I do not label my sexual orientation”	N/A
	Prior STI diagnosis	“Have you EVER been told by a doctor or nurse that you had a STI, such as HIV, chlamydia, trichomoniasis, syphilis, gonorrhea, genital herpes, hepatitis B, hepatitis C, or another STI?”	(1) Yes; (2) No	Frequency of dichotomous yes/no responses	N/A
	Number of sexual partners (past 12 months)	“How many individuals have you had any form of sexual contact with in the last 12 months (1 year)? Sexual contact includes penetrative sex using fingers or fists; oral/genital sex; oral/anal sex; receptive and/or insertive frontal sex; receptive and/or insertive anal sex, and use of prosthetics/foys.”	Continuous number of sexual partners	Median and IQR of number of sex partners	Continuous number of sexual partners
Partnership	Gender identity	“What was this partner’s gender identity?”	(1) Cisgender/nontransgender man; (2) Cisgender/nontransgender woman; (3) Transgender man (FTM); (4) Transgender woman (MTF); (5) Male-assigned gender nonconforming/nonbinary person; (6) Female-assigned gender nonconforming/nonbinary person	Frequency of gender identity categories: Transgender male (FTM); Transgender female (MTF); Male-assigned gender nonconforming/nonbinary person; Female-assigned gender nonconforming/nonbinary person; Cisgender male; Cisgender female	Models 1–4: Transgender male (FTM)/AFAB gender nonconforming/nonbinary; Transgender female (MTF)/AMAB gender nonconforming/nonbinary; Cisgender male; Cisgender female Model 5: Transgender female (MTF) & Cisgender male; Transgender male; (FTM) & Cisgender female

(continued)

TABLE 1. (CONTINUED)

<i>Level</i>	<i>Measure</i>	<i>Question</i>	<i>Response options</i>	<i>Coding for descriptive statistics</i>	<i>Coding for GEEs</i>
	Sexual partnership configuration	“How would you describe your relationship with this partner? Check all that apply.”	(1) Married or in a civil partnership; (2) Serious relationship (boyfriend/girlfriend/partner), someone you dated for awhile and feel very close to; (3) Casually dating, but not serious; (4) Poly; (5) Open relationship/nonmonogamous; (6) Sleeping with this person (“booty call”), but not dating; (7) Dom/sub; (8) Fluid-bonded; (9) One-night stand; (10) Stranger or anonymous person; (11) Exchange partner/sex work client; (12) “Another relationship configuration, please specify”	Frequency of sexual partnership configuration categories: Monogamous relationships; Nonmonogamous relationships; Casual sex relationships; defined as two partners likely engaging in sexual activity exclusively with one another, indicated by having a sole sex partner in the past 12 months and selecting a corresponding relationship status (e.g., “married or in a civil partnership”) Nonmonogamous relationships: defined as partnerships in which two or more sex partners had co-constructed arrangements for engaging in sex, indicated by having more than one sex partner in the past 12 months and selecting a corresponding relationship type (e.g., “polyamorous”) Casual sex: defined as instances of sex occurring outside a romantic relationship, often on a one-time basis (e.g., “one-night stand”)	Monogamous relationships; Nonmonogamous relationships; Casual sex

AFAB, assigned female at birth; AMAB, assigned male at birth; FTM, female-to-male; GEEs, generalized estimating equations; IQR, interquartile range; N/A, not applicable; STI, sexually transmitted infection.

Statistical analyses

Statistical analyses were conducted using SAS v9.4. Participant demographics were summarized using descriptive statistics. Primary analysis consisted of examining associations between characteristics of transmasculine participants' sexual partnerships and their use of a protective barrier for five sexual behaviors (see Table 1, under "Level," "Outcome"). Participants could provide information for up to three sexual partnerships, hence sexual behavior and protective barrier use data at the partnership level were clustered by the individual (i.e., an individual's data could be represented in multiple partnerships). Analysis of the correlated data was performed using generalized estimating equations (GEEs) with an exchangeable within-subject correlation structure and logistic link function at $\alpha=0.05$. Odds ratios (ORs) and 95% Wald confidence intervals (CIs) were estimated. Due to having a small sample size, coarse covariate parameters were used to ensure the convergence of GEE empirical covariance matrices.

Results

Participant demographics

Table 2 depicts participant demographics. The 141 transmasculine participants had a mean age of 27.4 years [standard deviation (SD)=5.7; range=21–50]. The sample was predominantly white (75.2%). Roughly half of the participants identified as transgender men (FTM; 50.4%), followed by man/male (27%), genderqueer/nonbinary (19.2%), and another gender (3.6%). The most common sexual orientation reported was queer (46.1%), followed by straight/heterosexual (11.4%), bisexual (12.8%), and gay/homosexual/same-gender attraction (9.9%). The median number of sexual partners within the past 12 months was 2 [interquartile range (IQR)=3]. Overall, 14.9% of participants reported having a prior STI diagnosis of either HIV, chlamydia, trichomoniasis, syphilis, gonorrhea, genital herpes, hepatitis B, hepatitis C, and/or another STI. One transmasculine participant reported an HIV-positive serostatus.

Characteristics of sexual partnerships

Collectively, transmasculine participants provided data for 259 sexual partnerships from the past 12 months. The median number of partnerships reported was 1 (IQR=2). Most sexual partners were cisgender women (42.2%), followed by cisgender men (31.6%), transgender men (FTM)/nonbinary AFAB (17.2%), and transgender women (MTF)/nonbinary assigned male at birth (AMAB; 9%). Most sexual partnerships were instances of casual sex (42.9%), followed by monogamous relationships (35.6%) and nonmonogamous relationships (21.5%). None of the transmasculine participants' sexual partners were diagnosed with HIV, while 2.7% were diagnosed with human papillomavirus (HPV) and 5.8% were diagnosed with herpes simplex virus (HSV) type I or II.

Protective barrier use by sexual behavior

Table 3 displays protective barrier use by sexual behavior among the 259 sexual partnerships. Table 4 presents ORs for participants' use of a protective barrier while engaging in the five sexual behaviors.

TABLE 2. PARTICIPANT DEMOGRAPHICS
(N=141 TRANSMASCULINE ADULTS)

Characteristics	N=141
Age (years), n (%)	
21–24	45 (31.91)
25–29	57 (40.43)
30–34	25 (17.73)
35–50	14 (9.93)
Age (years), mean (SD)	27.40 (5.70)
Race, n (%)	
White/Caucasian	106 (75.18)
Black/African American	4 (2.84)
Asian	8 (5.67)
Native Hawaiian or other Pacific Islander	1 (0.01)
Multiracial	21 (14.89)
Missing	1 (0.01)
Gender identity, n (%)	
Man/male	38 (26.95)
Transgender man (FTM)	71 (50.35)
Genderqueer/nonbinary	27 (19.15)
Another gender ^a	5 (3.55)
Sexual orientation, n (%)	
Gay/homosexual/same-gender attraction	14 (9.93)
Straight/heterosexual	16 (11.35)
Bisexual	18 (12.77)
Queer	65 (46.10)
Pansexual	13 (9.22)
Asexual	3 (2.16)
Questioning/unsure	3 (2.13)
I do not label my sexual orientation	7 (4.96)
Missing	2 (0.01)
Prior STI diagnosis ^b , n (%)	
No	120 (85.11)
Yes	21 (14.89)
Number of sexual partners within the past 12 months, median (IQR)	2 (3)

^aIncludes agender, bigender, and written-in gender identities distinguishable from the categories provided.

^bIncludes any lifetime diagnosis of HIV, chlamydia, trichomoniasis, syphilis, gonorrhea, genital herpes, hepatitis B, hepatitis C, or another STI.

FTM, female-to-male; IQR, interquartile range; SD, standard deviation; STI, sexually transmitted infection.

Performing frontal and/or anal penetration with a finger/fist. A total of 173 sexual partnerships involved participants performing frontal and/or anal penetration with a finger/fist, of which 23.7% used a protective barrier at least once ($n=41$). Participants ages 21–24 years had significantly lower odds of using a protective barrier while performing frontal and/or anal penetration with a finger/fist compared with those 30–50 years (OR=0.24, 95% CI=0.08–0.76, $p=0.01$). Additionally, participants in nonmonogamous relationships had significantly higher odds of protective barrier use relative to those in monogamous relationships (OR=3.61, 95% CI=1.29–10.06, $p=0.01$). Participants with transgender male (FTM)/nonbinary AFAB sex partners had significantly higher odds of using a protective barrier compared with those with cisgender female partners (OR=2.59, 95% CI=1.07–6.30, $p=0.04$).

Receiving frontal and/or anal penetration with a finger/fist. A total of 170 sexual partnerships involved participants

TABLE 3. PROTECTIVE BARRIER USE BY SEXUAL BEHAVIOR (*N*=259 SEXUAL PARTNERSHIPS)

<i>Sexual behavior</i>	<i>n</i> ^a	<i>Frequency of barrier use, n (%)</i>	
		<i>Never used a barrier</i>	<i>Used a barrier at least once</i>
Performing genital and/or anal penetration with a finger/fist	173	132 (76.30)	41 (23.70)
Receiving genital and/or anal penetration with a finger/fist	170	134 (78.82)	36 (21.18)
Performing oral/genital sex	216	184 (85.19)	32 (14.81)
Receiving oral/genital sex	182	162 (89.01)	20 (10.99)
Performing oral/anal sex	49	39 (79.59)	10 (20.41)
Receiving oral/anal sex	44	34 (77.27)	10 (22.73)
Insertive sex with genitals	46	29 (63.04)	17 (36.96)
Receptive sex with genitals	105	42 (40)	63 (60)
Insertive sex with a toy/prosthetic	113	44 (38.94)	69 (61.06)
Receptive sex with a toy/prosthetic	87	41 (47.13)	46 (52.87)
Anal insertive sex with genitals	9	2 (22.22)	7 (77.78)
Anal receptive sex with genitals	31	6 (19.35)	25 (80.65)
Anal insertive sex with toy/prosthetic	51	17 (33.33)	34 (66.67)
Anal receptive sex with toy/prosthetic	36	11 (30.56)	25 (69.44)
Insertive sex where toys/prosthetics were shared	62	21 (33.87)	41 (66.13)

^aNumber of sexual partnerships in which the sexual behavior occurred at least once.

receiving frontal and/or anal penetration with a finger/fist, of which 21.2% used a protective barrier at least once (*n*=36). Participants ages 21–24 years had significantly lower odds of using a protective barrier while receiving frontal and/or anal penetration with a finger/fist relative to those ages 30–50 (OR=0.15, 95% CI=0.04–0.55, *p*=0.004). Participants with cisgender male sex partners had significantly lower odds of using a protective barrier relative to those with cisgender female partners (OR=0.20, 95% CI=0.05–0.83, *p*=0.03).

Performing oral/genital sex. A total of 216 sexual partnerships involved participants performing oral/genital sex, of which 14.8% used a protective barrier at least once (*n*=32). Compared with participants with cisgender female partners, those with transgender female sex partners had significantly higher odds of using a protective barrier while performing oral/genital sex (OR=4.84, 95% CI=1.66–14.02, *p*=0.004).

Receiving oral/genital sex. A total of 182 sexual partnerships involved participants receiving oral/genital sex, of which 11% used a protective barrier at least once (*n*=20). Participants who received oral/genital sex from a cisgender male partner had significantly lower odds of using a protec-

tive barrier compared with those with a cisgender female partner (OR=0.11, 95% CI=0.01–0.88, *p*=0.04).

Frontal receptive sex with genitals. A total of 105 sexual partnerships involved participants having frontal receptive sex with their genitals, of which 60% used a protective barrier at least once (*n*=63). Relative to participants with transgender male or cisgender female sex partners, those with transgender female or cisgender male sexual partners had significantly higher odds of using a protective barrier during frontal receptive sex with genitals (OR=11.37, 95% CI=3.57–36.24, *p*<0.0001).

Discussion

Transmasculine adults in this study reported diverse demographics, sexual behaviors, and sexual partnerships. Consistent with prior research, participants engaged in an array of sexual behaviors, including receptive genital sex.^{7,11} While prior qualitative research suggests some transmasculine adults may avoid frontal receptive sex due to feelings of gender dysphoria,⁷ 40.5% of the sexual partnerships in the current study involved engaging in the behavior in the past 12 months (*n*=105). The heterogeneity of transmasculine adults' sexual behaviors may accentuate the importance of multiple HIV/STI risk reduction strategies, as a one-size-fits-all approach to prevention is unlikely to encapsulate the sexual health needs of this population.

At the individual level, participant age exhibited a significant association with protective barrier use, while racial identity did not. The statistical significance of the association between age and protective barrier use, however, varied across sexual behaviors. For instance, younger participants had significantly lower odds of using a protective barrier during frontal and/or anal penetration with a finger/fist. However, when modeling oral/genital sex, the association between age and protective barrier use failed to reach statistical significance. Race and protective barrier use were not significantly associated in the current study, echoing findings from prior research.³ Future studies may benefit from proportional sampling when investigating race-associated differences in protective barrier use among transmasculine adults, as this sampling scheme would likely improve statistical power.

At the partnership-level, a sexual partner's gender identity and the configuration of the sexual partnership were significantly associated with participants' use of a protective barrier. According to prior qualitative research, TMSM may forgo protective barrier use during sex if it ensures remaining desirable to their male partners.¹⁵ However, despite failing to reach statistical significance, TMSM in the current study had higher odds of using a protective barrier while performing oral/genital sex relative to participants with cisgender women partners. Participants in the current study also reported diverse sexual partnership configurations, including sex-oriented, nonmonogamous, and monogamous structures. Compared with participants in monogamous partnerships, those in nonmonogamous configurations (e.g., polyamorous) had significantly higher odds of using a protective barrier while performing or receiving frontal and/or anal penetration with a finger/fist. This finding may raise a nuanced question about whether multiple partners or unfamiliar

TABLE 4. ADJUSTED ODDS RATIOS FOR THE USE OF A PROTECTIVE BARRIER BY SEXUAL BEHAVIOR (N=259 SEXUAL PARTNERSHIPS)

Covariates	Model 1. Performing genital and/or anal penetration with a finger/fist (n = 173) ^a		Model 2. Receiving genital and/or anal penetration with a finger/fist (n = 170) ^a		Model 3. P oral/genital sex (n = 213) ^a		Model 4. Receiving oral/genital sex (n = 182) ^a		Model 5. Frontal receptive sex with genitals (n = 105) ^a	
	OR (95% CI)	p	OR (95% CI)	p	OR (95% CI)	p	OR (95% CI)	p	OR (95% CI)	p
Age of participant (years)										
21–24	0.24 (0.08–0.76)	0.01	0.15 (0.04–0.55)	0.004	0.83 (0.24–2.81)	0.76	0.41 (0.08–2.01)	0.27	—	—
25–29	0.79 (0.31–2.04)	0.63	0.40 (0.14–1.14)	0.08	1.30 (0.45–3.73)	0.63	1.21 (0.35–4.22)	0.76	—	—
30–50	Ref	—	—	—	—	—	—	—	—	—
Age of participant (continuous years) ^b	—	—	—	—	—	—	—	—	0.97 (0.87–1.07)	0.51
Race of participant										
Non-white	1.88 (0.80–4.44)	0.15	2.12 (0.88–5.09)	0.09	1.79 (0.67–4.80)	0.24	2.60 (0.95–7.12)	0.06	0.36 (0.12–1.07)	0.07
White	Ref	—	—	—	—	—	—	—	—	—
Configuration of the sexual partnership										
Casual sex	1.10 (0.40–2.97)	0.86	0.90 (0.29–2.80)	0.85	1.36 (0.50–3.73)	0.55	2.39 (0.49–11.60)	0.28	0.98 (0.35–2.72)	0.96
Nonmonogamous relationship	3.61 (1.29–10.06)	0.01	2.33 (0.71–7.62)	0.16	2.15 (0.66–7.01)	0.21	4.25 (1.03–17.63)	0.05	0.84 (0.26–2.74)	0.78
Monogamous relationship	Ref	—	—	—	—	—	—	—	—	—
Gender identity of sexual partner										
Transgender man (FTM) ^c	2.59 (1.07–6.30)	0.04	2.74 (1.01–7.45)	0.05	0.25 (0.03–2.40)	0.23	0.70 (0.22–2.24)	0.55	—	—
Transgender woman (MTF) ^d	2.05 (0.55–7.71)	0.29	0.40 (0.08–2.02)	0.27	4.83 (1.66–14.02)	0.004	1.34 (0.43–4.18)	0.61	—	—
Cisgender man	0.46 (0.12–1.85)	0.28	0.20 (0.05–0.83)	0.03	1.47 (0.52–4.18)	0.47	0.11 (0.01–0.88)	0.04	—	—
Cisgender woman	Ref	—	—	—	—	—	—	—	—	—
Gender identity of sexual partner (consolidated) ^e										
Transgender woman (MTF) ^d & Cisgender man	—	—	—	—	—	—	—	—	11.37 (3.57–36.24)	<0.0001
Transgender man (FTM) ^c & Cisgender woman	—	—	—	—	—	—	—	—	Ref	—
Number of sexual partners in the past 12 months	1.02 (0.95–1.10)	0.53	1.11 (0.97–1.28)	0.12	1.02 (0.94–1.10)	0.63	0.89 (0.69–1.15)	0.36	1.08 (0.90–1.29)	0.43

Bolding indicates $p < 0.05$.

Results from GEEs with 259 sexual partnerships reported by 141 participants.

^aNumber of sexual partnerships in which the sexual behavior occurred.

^bDue to sample size concerns, age was operationalized as continuous years in Model 5 to ensure model convergence.

^cIncludes AFAB, gender nonconforming/nonbinary persons.

^dIncludes AMAB, gender nonconforming/nonbinary persons.

^eDue to an elevated prevalence of STIs/HIV among transgender women and cisgender men, and to improve statistical efficiency, these gender identities were collapsed into a sole group for Model 5. AFAB, assigned female at birth; AMAB, assigned male at birth; FTM, female-to-male; GEEs, generalized estimating equations; STIs, sexually transmitted infections.

partners underlie HIV/STI risk for transmasculine adults. Research is needed on how transmasculine adults in non-monogamous relationships negotiate protective barrier use with sex partners, as negotiation methods within these relationships may be distinct from those used in casual or monogamous sexual partnerships. Furthermore, despite prior research depicting low pre-exposure prophylaxis (PrEP; i.e., medication to prevent the acquisition of HIV) uptake among transmasculine adults,^{19,20} future studies may benefit from studying whether transmasculine adults' PrEP use influences their use of protective barriers.

Multiple limitations surround the current study. First, the sample was predominantly white and under 30 years of age, thus limiting the generalizability of study findings. Second, coarse demographic covariates were necessary to ensure GEE model convergence. The collapsing of categorical variables, and the use of continuous age in years in Model 5, may have resulted in a loss of precision for detecting within-group differences in protective barrier use. Prior studies on protective barrier use among transmasculine individuals have encountered similar obstacles related to small sample sizes.³ Third, by combining fingering and fisting behaviors (both anal and genital), we could not identify differences in protective barrier use between these behaviors. Future studies would benefit from disaggregating fingering and fisting behaviors, as unprotected fisting may convey greater risk for blood-borne virus transmission (e.g., research with HIV-positive MSM has found a statistically significant association between unprotected anal fisting and hepatitis C transmission/contraction).²¹ Fourth, we asked about specific sexual behaviors tied to the gender of sexual partners, but did not ask about the anatomy of sexual partners. For example, we asked about frontal receptive sex with a trans female partner, from which we may be able to infer that the trans female partner did not have a neovagina, particularly given another survey question asked about toys or prosthetics for penetration; however, such an inference is limited because sexual partner anatomy was not directly queried. Finally, while multiple gender and racial identities were consolidated into unrefined categories for statistical modeling, we acknowledge these identities are distinct and warrant individual assessment in future research.

Findings from this study have implications for promoting the sexual health of transmasculine adults. First, results depict transmasculine adults engaging in an array of sexual behaviors with diverse sexual partners. Second, in research and clinical practice with transmasculine adults, gender-affirming sexual risk assessments can be used to capture the breadth of transmasculine adults' sexual lives. Third, this study underscores the importance of evaluating the varied contributors to sexual risk for HIV/STIs located beyond the individual, as the gender identity of a sexual partner and the configuration of a sexual partnership were both statistically significantly associated with transmasculine adults' protective barrier use (although these associations were behavior-specific). Lastly, findings should be considered broadly in understanding transmasculine adults' sexual health, including outside the specific realm of HIV/STIs.

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No competing financial interests exist.

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Address correspondence to:
David R. Pletta, MPH
The Fenway Institute
Fenway Health
1340 Boylston Street
Boston, MA 02215

E-mail: dpletta@fenwayhealth.org