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Sexual Behaviors and Sexually Transmitted Infections Among Self-Identified Lesbian and Bisexual College Women

Lisa L. Lindley
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ABSTRACT. Sexually transmitted infections (STIs) are a significant health issue for lesbian and bisexual women. Older age and having a history of sexual intercourse with males are primary risk factors for STIs among this population. However, little research has been conducted to assess sexual risk among lesbian and bisexual college women exclusively. A cross-sectional Internet survey was conducted with 230 self-identified lesbian and bisexual female college students to examine their sexual risk and to determine with which, if any, STIs they had ever been diagnosed. Eight percent of lesbian and bisexual college women reported ever being diagnosed with an STI; the human papillomavirus, bacterial vaginosis, and genital herpes accounted for 84% of STI cases. Number of lifetime sex partners was significantly associated with an STI diagnosis among this population. Older age, engaging in penile–vaginal intercourse with a male (lifetime), and younger age at first same-sex experience were significantly associated with a greater number of lifetime sex partners. Results may be useful to sexual health programs targeting lesbian and bisexual college women and/or their providers.

KEYWORDS. Lesbians, bisexual women, college students, sexual behavior, sexually transmitted infections (STIs)

Sexually transmitted infections (STIs) are a significant health issue for women who have sex with women (WSW). Depending on the STI and/or population of women being studied, between 2% and 31% of WSW have reported an STI diagnosis during their lifetime (Bailey, Farquhar, Owen, & Mangtani, 2004; Carroll, Goldstein, Lo, & Mayer, 1997; Diamant, Lever, & Schuster, 2000; Dolan & Davis,

2003; Marrazzo, 2000; Marrazzo et al., 1998; Marrazzo, Koutsky, Kiviat, Kuypers, & Stine, 2001; Marrazzo, Stine, & Wald, 2003; O’Hanlan & Crum, 1996). Infection with bacterial vaginosis (BV) and candida have been particularly common, and herpes simplex type-2 (HSV-2) antibodies and human papillomavirus (HPV) DNA were detected in 8% and 30%, respectively, of one WSW population (Bailey et al., 2004;

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Carroll et al., 1997; Diamant et al., 2000; Dolan & Davis, 2003; Marrazzo, 2000; Marrazzo et al., 1998; Marrazzo et al., 2001; Marrazzo et al., 2003; O'Hanlan & Crum, 1996). In most instances, WSW who received an STI diagnosis, especially with HSV-2 and/or HPV, had no idea they were infected (Bailey et al., 2004; Carroll et al., 1997; Diamant et al., 2000; Dolan & Davis, 2003; Ferris, Batish, Wright, & Cushing, 1996; Marrazzo, 2000; Marrazzo et al., 1998; Marrazzo et al., 2001; Marrazzo et al., 2003; O'Hanlan & Crum, 1996).

In addition to older age, having a history of sexual intercourse with men is a significant predictor of an STI among WSW (Bailey et al., 2004; Carroll et al., 1997; Diamant et al., 2000; Dolan & Davis, 2003; Marrazzo, 2000; Marrazzo et al., 1998; Marrazzo et al., 2001; Marrazzo et al., 2003; O'Hanlan & Crum, 1996). In fact, most WSW (53%–99%) engaged in penile–vaginal intercourse with a man during their lifetime, and many (8%–30%) continued to do so (Bailey et al., 2004; Bailey, Farquhar, Owen, & Whittaker, 2003; Carroll et al., 1997; Cochran, Bybee, Gage, & Mays, 1996; Diamant et al., 2000; Einhorn & Polgar, 1994; Marrazzo, 2000; Marrazzo, Coffey, & Bingham, 2005; Marrazzo et al., 2001; Marrazzo et al., 1998; Marrazzo et al., 2002; Marrazzo et al., 2003; Morrow & Allsworth, 2000). WSW have also engaged in unprotected sexual intercourse with gay and bisexual men and/or with injection drug using men, putting them at greater risk for STIs, including HIV (Einhorn & Polgar, 1994; Koh, Gomez, Shade, & Rowley, 2005).

Although prior sexual intercourse with men is a significant predictor of an STI among WSW, it is important to note that transmission of trichomoniasis, syphilis, HIV, HPV and genital herpes have been well-documented between and/or prevalent among WSW who never had sex with men (Bailey et al., 2004; Campos-Outcalt & Hurwitz, 2002; Carroll et al., 1997; Diamant et al., 2000; Dolan & Davis, 2003; Kwakwa & Ghobrial, 2003; Marrazzo, 2000; Marrazzo et al., 1998; Marrazzo et al., 2001; Marrazzo et al., 2003; O'Hanlan & Crum, 1996). Moreover, sexual behaviors in which WSW frequently report engaging, such as orogenital sex, vaginal penetration with fingers, and sharing sex

toys with female partners, have been associated with STI transmission (Diamant et al., 2000; Ferenczy, Bergeron, & Richart, 1989; Marrazzo et al., 1998, 2001; O'Hanlan & Crum, 1996; Sonnex, Strauss, & Gray, 1999).

Despite the prevalence of STIs among WSW, these women do not perceive themselves to be at risk for, and in some instances feel “invulnerable” to infection. (Goldstein, 1995; Hollander, 1996; Lampon, 1995; Lemp et al., 1995; Marrazzo et al., 2005; Norman & Perry, 1996; Richardson, 2000; Stevens, 2001). This perception is primarily due to a general lack of knowledge of the potential for STI transmission between women (Marrazzo et al., 2005). In some instances, healthcare providers, themselves, have misperceptions regarding the sexual behaviors in which WSW engage, especially lesbians, causing them to underestimate STI risk and/or fail to discuss STIs or safer sex practices with these female patients (Marrazzo, 2005).

It is important to recognize that distinct differences exist in women's sexual attractions, sexual behaviors and sexual identities. For example, women tend to report nonexclusive sexual attractions (being sexually attracted to both men and women) more often than exclusive sexual attractions (being only sexually attracted to men or only sexually attracted to women; Laumann, Gagnon, Michael, & Michaels, 1994; Russell & Seif, 2002). However, WSW may or may not identify themselves as “lesbian” or “bisexual” (Laumann et al., 1994; Russell & Seif, 2002).

Moreover, women's sexuality tends to be fluid over time, meaning that longitudinal changes frequently occur in sexual identity, attraction, and/or behavior, among both heterosexual and nonheterosexual women (Diamond, 2005; Weinberg, Williams, & Pryor, 1994). This was best exemplified in an 8-year longitudinal investigation of sexual identity development in young women (aged 18 to 25 years), where nearly one-third of the 79 nonheterosexual women claimed both lesbian and nonlesbian identities at different points in time (Diamond, 2005). Sexual identity among these young women was significantly associated with their level of same-sex attraction and same-sex behavior. Young women

who maintained a lesbian identity over time reported the highest level of same-sex attraction and greatest percent of same-sex sexual contacts, compared to women who maintained a nonlesbian identity or who changed from a lesbian to nonlesbian identity at different points in time (Diamond, 2005).

Differences in sexual behaviors have also been reported among lesbian populations based on their *erotic role identification*. In other words, lesbians who described themselves as being “butch” or more “masculine” assumed the sex role of *bottom*, less often and had more sex partners during the past 2 years than “femme” or “feminine” lesbians (Singh, Vidaurri, Zambarano, & Dabbs, 1999).

With regard to the sexual behaviors of lesbian and bisexual college women or their experiences with STIs, very little is known. Nearly all of the research conducted with WSW were of older populations of self-identified lesbian and bisexual women in the United Kingdom and/or in lesbian bars, at music festivals, or in STI clinics in the United States (Bailey et al., 2004; Bailey et al., 2003; Carroll et al., 1997; Diamant et al., 2000; Einhorn & Polgar, 1994; Marrasso, 2000; Marrasso et al., 1998; Marrasso et al., 2001; Marrasso et al., 2003; Morrow & Allsworth, 2000). No study has examined sexual risk behaviors and STIs among self-identified lesbian and bisexual college women exclusively; that was the purpose of this investigation. To develop appropriate sexual health education materials and STI prevention programs for lesbian and bisexual college women, as well as to provide these women with appropriate sexual health services, such research is warranted.

During the 2001–2002 academic year, the *National Lesbian, Gay, Bisexual and Transgender (LGBT) College Student Survey* was conducted to determine the extent to which self-identified LGBT college students engaged in a variety of health risk behaviors, including sexual risk behaviors. Results regarding self-reported sexual behaviors and diagnoses with STIs among self-identified lesbian and bisexual college women, including significant differences based on sexual attraction and/or masculinity/femininity, are the focus of this article.

METHODS

Data Collection

This investigation utilized a cross-sectional survey design to measure health risk behaviors and personal experiences of self-identified LGBT college students in the United States. The survey instrument contained four separate sections, with a total of 275 items. The first section of the survey (31 items) collected demographic information regarding LGBT college students’ age, race/ethnicity, year in school, residence, sexual orientation/attraction, masculinity/femininity, relationship status, and college/university information. The second section (131 items) measured respondents’ external assets including the quality of their relationships with parents, friends, classmates, teachers, and other adults; the health and safety of their home, college, and neighborhood environments; and participation in a variety of college and community LGBT activities.

The third section of the survey (84 items) measured the health risk behaviors of self-identified LGBT college students. Items from the Center for Disease Control and Prevention’s (CDC) 1995 *National College Health Risk Behavior Survey* (NCHRBS) were used to measure six areas of health risk behaviors: unintentional and intentional injuries, tobacco use, alcohol and other drug use, sexual behaviors, dietary behaviors, and physical activity (CDC, 1997). With regard to sexual behaviors assessed in this investigation, the following items from the NCHRBS were included: students’ participation in sexual intercourse (lifetime and 3 months preceding the survey); age of initiation of sexual intercourse; number of sex partners (total, male, and female; lifetime and past 3 months); condom/barrier use (last sex); if they had ever been forced to have sexual intercourse; and if they had ever been tested for HIV. In addition, LGBT college students were asked to report the age at which they first had sex with a person of the same sex; if they had ever engaged in any of 30 different sexual behaviors listed in the survey; how often they used condoms or other barriers during penile–vaginal, anal, and/or oral sex; and with which (if any)

STIs they had ever been diagnosed during their lifetime.

The fourth section (29 items) of the survey measured respondents' internal assets. Commitment to learning, positive values, social competencies, and self-identity are examples of internal assets measured in this section. Items from sections two and four (external and internal assets, respectively) were taken from Search Institute's *Profiles of Student Life: Attitudes and Behaviors* survey (Leffert et al., 1998). However, this survey was originally constructed for and used to measure assets among middle and high school students. Thus, items were modified to be appropriate for college students by having students report retrospectively on their experiences during high school.

The survey was administered via the World Wide Web, which has been explored by other researchers as a viable means of data collection with hidden populations (Nicholson, White, & Duncan, 1999). The questionnaire was written using Hyper Text Markup Language and a PERL script for handling anonymous Common Gateway Interface forms was used to process survey responses. Responses were stored as tab delimited text files that could be exported into an SPSS data file for analysis. The survey was posted on the World Wide Web and hosted by a local Internet Service Provider using a domain name/URL (<http://www.lgbtccs.org>) purchased by the researchers.

Prior to conducting the online survey, a national advisory committee consisting of sexuality and LGBT researchers from across the country was formed to provide recommendations regarding the content of the survey instrument. Members of the advisory committee were selected because of their expertise working with LGBT youth, LGBT college students, and/or in assessing individual and/or community assets. The knowledge and diversity of experiences of committee members assisted in strengthening the content validity of the survey instrument. In addition, the online survey was pilot-tested with students from the LGBT student organization at Western Kentucky University. Feedback was provided regarding survey format, content and/or technological problems from advisory committee members and LGBT college

students who participated in the pilot study via small group discussions, e-mail, and telephone correspondence. Minor adjustments and/or corrections were made to several items/questions within the survey before the final instrument was posted.

Recruitment of Study Participants

Packets containing a letter of invitation to participate in the study, flyers with the study's description, and postcards with the study's Web site address were mailed to 110 LGBT college student organizations and resource centers across the United States in October, 2001. Information about LGBT college student organizations and resource centers was obtained from the National Consortium of Directors of LGBT Resources in Higher Education, which maintains a list of professionally staffed LGBT college and university offices in the United States. Faculty advisors and officers of LGBT student organizations were encouraged to post flyers, distribute postcards to students, and create a link to the survey from their organization's Web site. The National LGBT College Student Survey was accessible online from October 15, 2001 through May 31, 2002 to maximize participation of LGBT college students during both the Fall and Spring semesters. The average time it took respondents to complete the survey was 45 min.

Data Analysis

In addition to descriptive analyses, Chi-square, *t*-test, analysis of variance (ANOVA) tests and multiple comparisons using the Tukey post-hoc procedure were conducted to determine if significant associations existed between response categories and the following characteristics of respondents: age (18–20 years vs. 21+ years), sexual orientation/attraction (women exclusively vs. primarily women/occasionally men vs. both women and men equally vs. primarily men/occasionally women), masculinity/femininity (mostly/extremely masculine vs. androgynous vs. mostly/extremely feminine), and age women "came out" (≤ 13 years vs. 14–17 years vs. 18+ years).

Comparisons were also made based on the following sexual behaviors/experiences of

respondents: age of first sex; age of first same-sex; ever forced to have sex; ever engaged in penile–vaginal intercourse; ever engaged in anal receptive intercourse; used condom/other barrier at last sex; number of sex partners (lifetime and past 3 months); number of male sex partners (lifetime and past 3 months); number of female sex partners (lifetime and past 3 months); and ever diagnosed with an STI.

A logistic regression analysis was conducted to identify characteristics significantly associated with an STI diagnosis among lesbian and bisexual college women. Last, a multiple regression analysis using the forward stepwise procedure for model building was conducted to determine which personal characteristics and/or sexual behaviors/experiences explained most of the variance in total number of sex partners during their lifetime. SPSS 13.0 was used for data analyses and all tests were considered significant at or below the .05 alpha level.

RESULTS

Participants

A total of 230 self-identified lesbian and bisexual female college students completed the online survey. The majority (82.8%) of these women was White (non-Hispanic), of traditional college age (18–24 years) (86.5%), and attended a 4-year (98.7%), nonreligiously-affiliated (84.7%), public (64.0%) institution. A near even distribution of undergraduate students was reported across year in school, and most lesbian and bisexual college women lived either on campus in a residence hall or off campus with friends (Table 1).

The extent to which lesbian and bisexual college women were sexually attracted to persons of the same and/or opposite sex is presented in Table 2. It is important to note that a wide distribution was reported across sexual orientation/attraction categories. A near equal proportion of lesbian and bisexual college women were “exclusively sexually attracted to females” or “primarily sexually attracted to females, occasionally sexually attracted to males.” Another third were “equally sexually

TABLE 1. Demographic Characteristics of Respondents

Characteristic	<i>n</i>	%
Age (<i>n</i> = 229)		
18 years	36	15.7
19 years	50	21.8
20 years	34	14.9
21 years	46	20.1
22 years	17	7.4
23 years	10	4.4
24 years	5	2.2
25+ years	31	13.5
Race/Ethnicity (<i>n</i> = 227)		
White (non-Hispanic)	188	82.8
Black (non-Hispanic)	7	3.4
Hispanic/Latina	12	5.3
Asian/Pacific Islander	6	2.6
Other	4	1.8
Year in School (<i>n</i> = 229)		
Freshman	44	19.2
Sophomore	44	19.2
Junior	45	19.7
Senior	56	24.5
Graduate	35	15.3
Other	5	2.2
Residence (<i>n</i> = 230)		
Residence hall	94	40.9
Off campus with friends	53	23.0
Off campus with partner	33	14.3
Off campus alone	18	7.8
Off campus w/parents	17	7.4
Other university housing	14	6.1
Sorority house	1	0.4

attracted to males and females,” “primarily sexually attracted to males, occasionally sexually attracted to females” or “exclusively sexually attracted to males.” Due to the small number of women who were “exclusively sexually attracted to males,” these respondents were not included in the analyses.

A near equal distribution of lesbian and bisexual college women first became aware of their sexual attraction to other women between the ages of 10 and 14 years, or between 15 and 18 years. Fewer were first aware of their same-sex attraction before the age of 10 or at the age of 19 years or older (Table 2). Lesbian and bisexual college women who were “exclusively sexually attracted to females” (23.7%) or “equally sexually attracted to males and females” (21.1%) were significantly ($p = .038$) more likely to be younger (under the age of 10 years) when they

TABLE 2. Sexual Orientation, Age First Aware of Same Sex Attraction, Age “Came out,” Masculinity/Femininity, and Current Relationship Status of Respondents

Questions	<i>n</i>	%
To whom are you sexually attracted? (<i>n</i> = 229)		
Women exclusively	76	33.2
Primarily women, occasionally men	88	38.4
Men and women equally	38	16.6
Primarily men, occasionally women	25	10.9
Men exclusively	2	0.9
Age first aware of same-sex attraction (<i>n</i> = 230)		
Birth–4 years of age	7	3.0
5–9 years of age	36	15.7
10–14 years of age	88	38.3
15–18 years of age	76	33.0
19+ years of age	23	10.0
Age “came out” to self (<i>n</i> = 222)		
Birth–4 years of age	0	—
5–9 years of age	3	1.4
10–14 years of age	50	22.5
15–18 years of age	120	54.1
19+ years of age	49	22.1
Masculinity/femininity (<i>n</i> = 223)		
Mostly/extremely feminine	116	52.0
Androgynous	83	37.2
Mostly/extremely masculine	24	10.8
Current relationship status (<i>n</i> = 230)		
Committed relationship, no outside sex	100	43.5
Committed relationship with outside sex	9	3.9
Dating and having sex	18	7.8
Dating, not having sex	19	8.3
Not dating but having sex	12	5.2
Not dating and not having sex	68	29.6
Polyamorous relationship	4	1.7

first became aware of their same-sex attraction than college women who were “primarily sexually attracted to females, occasionally sexually attracted to males” (14.8%) or “primarily sexually attracted to males, occasionally sexually attracted to females” (8.0%).

Most lesbian and bisexual college women acknowledged their same-sex attraction (or “came out” regarding their sexual orientation) between the ages of 15 and 18 years. A near equal distribution of women “came out” between the ages of 10 and 14 years, or at the age of 19 years or older. Notably fewer lesbian and bisexual women “came out” before the age of 10 years. Overall, 62.6% of lesbian and bisexual college women “came out” before the age of 18 years,

and 37.4% “came out” at the age of 18 years or older.

Over half of the lesbian and bisexual women in this investigation described themselves as “mostly” or “extremely feminine;” more than a third described themselves as “androgynous,” or exhibiting equally masculine and feminine traits. Eleven percent described themselves as “mostly” or “extremely masculine.” It is important to note that lesbian and bisexual college women who described themselves as “mostly/extremely masculine” were significantly ($p < .001$) more likely to be younger (under the age of 10 years) when they first became aware of their same-sex attraction (41.7%) than “androgynous” (20.5%) or “mostly/extremely feminine” (12.9%) women. “Androgynous” and “mostly/extremely feminine” women became aware of their same sex attraction at older ages.

With regard to current relationship status, nearly half (47.4%) of the lesbian and bisexual college women surveyed were in a committed relationship. Although most (91.7%) of these women did not have sex outside of their current relationship, over 8% did. Approximately 30% of lesbian and bisexual college women reported that they were neither dating, nor having sex. Less than 2% were in a polyamorous relationship (Table 2).

Age of Initiation of Sexual Behaviors

The mean age at which lesbian and bisexual college women had their first sexual experience (defined as oral, anal, and/or vaginal intercourse) was 16.4 years ($SD = 3.04$). Two percent of lesbian and bisexual college women had their first sexual experience before the age of 13 years. The mean age at which lesbian and bisexual college women had their first sexual experience was significantly ($p < .001$) associated with the age at which they “came out.” Women who “came out” at or before the age of 13 years initiated sex at a significantly younger age (15.1 years) than women who “came out” between the ages of 14 and 17 years (16.2 years) or 18 years of age or older (17.4 years). Moreover, older lesbian and bisexual college women (aged 21 years or older) were significantly ($p < .001$) older when they had their first sexual experience (17.0 years) than

younger (aged 18–20 years) lesbian and bisexual college women (15.8 years).

The mean age at which lesbian and bisexual college women had their first same-sex sexual experience (defined as oral, anal, and/or vaginal intercourse) was 18.2 years ($SD = 2.57$). Older lesbian and bisexual college women (aged 21 years or older) were significantly ($p < .001$) older when they had their first same sex sexual experience than younger (aged 18–20 years) lesbian and bisexual college women (19.4 years vs. 16.9 years, respectively). In addition, the earlier the age at which college women “came out,” the earlier their first same-sex sexual experience. Women who “came out” at or before the age of 13 years or between the ages of 14 and 17 years had their first same sex experience at significantly ($p < .001$) younger ages (16.3 and 17.4 years, respectively) than women who “came out” at age 18 years or older (20.1 years).

Participation in Sexual Behaviors

Lesbian and bisexual college women in this investigation engaged in a variety of sexual behaviors during their lifetime (Table 3). Nearly all respondents (98.6%) had engaged in oral sex during their lifetime. Ninety-six percent received oral sex (from either a male or female partner); more than three-quarters performed oral sex on a female partner, and nearly two-thirds performed oral sex on a male partner during their lifetime. Most (82%) reported vaginally fingering a partner or being vaginally fingered (94%) by a partner, and 48% and 72%, respectively, used a dildo/vibrator on a partner or a partner used a dildo/vibrator on them. Half engaged in penile–vaginal intercourse and 17.0% engaged in anal receptive intercourse with a man during their lifetime.

Lesbian and bisexual college women who were “equally sexually attracted to males and females” were significantly more likely to have engaged in penile–vaginal intercourse ($p = .010$) and anal receptive intercourse ($p = .024$) with a man during their lifetime than women who were “exclusively sexually attracted to females,” “primarily sexually attracted to females, occasionally sexually attracted to males” or “primarily

TABLE 3. Sexual Behaviors in Which Respondents Ever Engaged (Lifetime; $N = 222$)

Sexual Behaviors	<i>n</i>	%
Received oral sex	213	95.9
Vaginal fingering (received)	208	93.7
Vaginal fingering (gave)	181	81.5
Mutual masturbation	172	77.5
Performed oral sex on female	172	77.5
Dildo/vibrator on self	160	72.1
Performed oral sex on male	140	63.1
Penile–vaginal intercourse (w/male)	124	55.9
Dildo/vibrator on partner	106	47.7
Sex in a public place	101	45.5
Bondage	100	45.0
Anal fingering (received)	85	38.3
Anal fingering (gave)	75	33.8
Sexual masochism (experiencing pain)	65	29.3
Threesome (or more)	62	27.9
Analingus/rimming (oral–anal contact)	53	23.9
Anal receptive intercourse (w/male)	44	19.8
Vaginal fisting (received)	38	17.1
Sexual sadism (inflicting pain)	38	17.1
Vaginal fisting (gave)	33	14.9
Troilism (having sex while others watch)	31	14.0
Anal plug	23	10.4
Anal beads on partner	14	6.3
Golden showers/water sports (sex play w/urine)	8	3.6
Autoerotic asphyxiation	8	3.6
Anal insertive intercourse	7	3.2
Sex for money	4	1.8
Anal fisting (gave)	3	1.4
Anal fisting (received)	0	—
Scat (sex play w/feces)	0	—

sexually attracted to males, occasionally sexually attracted to females.”

Most (80.8%) lesbian and bisexual college women in this investigation had never been forced to have sexual intercourse during their lifetime. Among the 19.2% who had been forced to have sexual intercourse, the mean age at which they were first forced to have sex was 15.1 years ($SD = 4.73$) and the mean age at which they were last forced to have sex was 16.3 years ($SD = 3.63$). More than one-quarter (28.6%) of lesbian and bisexual college women who had been forced to have sex during their lifetime were aged 13 years or younger when this first occurred. The sex of the partner who forced them to have sex was not assessed in this investigation.

Number and Sex of Sex Partners

The mean number of sex partners (lifetime) reported among lesbian and bisexual college women in this investigation was 5.9 ($SD = 6.00$; range = 0 to 40 partners) with a median of 4.0 partners. These women had a mean of 2.9 male ($SD = 3.96$; range = 0 to 26; median = 2.0) partners and 3.1 female ($SD = 4.57$; range = 0 to 34; median = 2.0) partners during their lifetime. During the past 3 months, lesbian and bisexual college women had a mean of 1.0 sex partner ($SD = 0.88$; range = 0 to 7) with a mean of 0.3 male ($SD = 0.68$; range 0 to 6) and 0.8 female ($SD = 0.75$; range = 0 to 4) sex partners.

No significant differences were reported in total number of sex partners (lifetime or past 3 months) based on sexual orientation/attraction or masculinity/femininity of lesbian and bisexual college women. However, significant differences were reported in number of male sex partners and number of female sex partners (lifetime and past 3 months) based on these characteristics. Specifically, the more sexually attracted women were to males, the more male sex partners they had. However, women who were “equally sexually attracted to males and females” had the most male partners (lifetime and past 3 months). Conversely, women who were “exclusively sexually attracted to females” had the most female sex partners (lifetime and past 3 months; Figure 1).

With regard to self-described masculinity/femininity, lesbian and bisexual college women

who were “feminine” or “androgynous” had significantly more male sex partners (past 3 months) than “masculine” women. Conversely, women who were “masculine” had significantly more female sex partners (lifetime and past 3 months) than “androgynous” or “feminine” women (Figure 2).

Condom/Barrier Use

When asked if they used a condom, dental dam, or other barrier method during their last sexual encounter (among those who had oral, anal, or vaginal intercourse), 80.2% of lesbian and bisexual female college students did not use any barrier. Slightly less than 20% did use a barrier method during their last sex. A significant ($p = .001$) difference in condom/barrier use at last sex was reported among women based on their level of sexual attraction to men. Specifically, the more sexually attracted women were to men, the more likely they were to use a condom/barrier during last sex: “exclusively sexually attracted to females” (5.7%); “primarily sexually attracted to females, occasionally sexually attracted to males” (21.5%); “equally sexually attracted to both males and females” (28.6%); and “primarily sexually attracted to males, occasionally sexually attracted to females” (40.0%).

Among lesbian and bisexual female college students who had ever engaged in penile–vaginal intercourse, 64.8% used condoms “consistently” (or “most” or “all of the time”). Nearly 14%

FIGURE 1. Mean Number of Male and Female Sex Partners (Lifetime and Past 3 Months) by Sexual Orientation (“To Whom Are You Sexually Attracted?”)

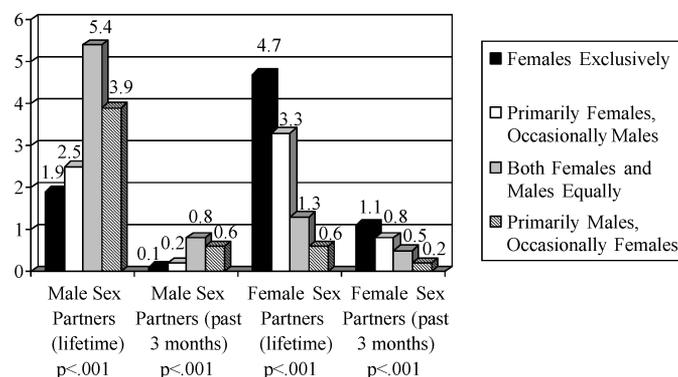
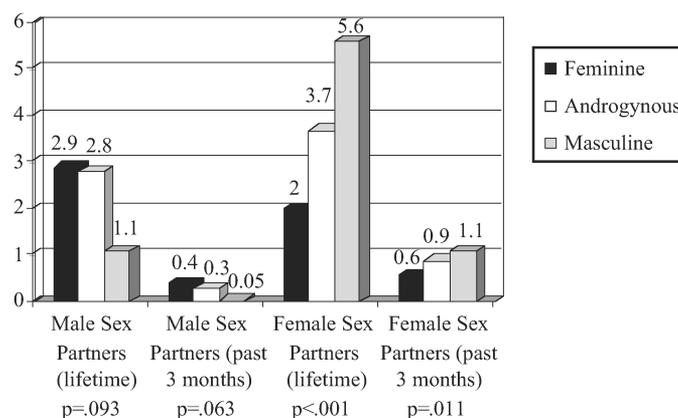


FIGURE 2. Mean Number of Male and Female Sex Partners (Lifetime and Past 3 Months) by Self-Described Masculinity/Femininity



used condoms “some of the time” and 18.9% “never” used condoms during penile–vaginal intercourse.

With regard to condom use during anal receptive intercourse among those who ever engaged in this behavior, 43.9% used condoms “consistently.” Nearly 46% “never” used a condom during anal intercourse. Another 10.5% used condoms “some of the time” during this behavior.

Nearly nine out of ten lesbian and bisexual college women (88.7%) never used condoms or any barrier method during oral sex. Less than 7% and 4%, respectively, used a barrier method “some of the time” or “most or all of the time” during oral sex.

HIV Antibody Testing and STI Diagnoses

Most lesbian and bisexual college women (60.6%) had never been tested for HIV during their lifetime, and 39.4% had been tested for HIV. Lesbian and bisexual college women who had been tested for HIV were significantly ($p < .001$) older than women who had never been tested (23.1 years vs. 20.6 years, respectively).

When asked if they had ever been diagnosed with an STI during their lifetime, 8.2% ($n = 19$) of lesbian and bisexual college women reported that they had; 91.8% ($n = 214$) reported that they had never been diagnosed with an STI. When asked to report with which, if any, STIs they had ever been diagnosed during their lifetime, roughly 2% or fewer had been diagnosed with genital herpes (2.1%), BV (2.1%),

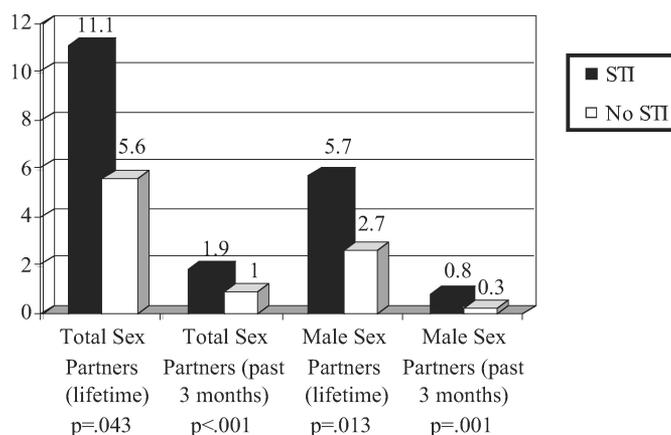
trichomoniasis (1.3%), chlamydia (0.9%), or an “other” STI (0.9%). No lesbian or bisexual college women had ever been diagnosed with HIV, gonorrhea, syphilis, or hepatitis B. Four women (1.7%) were diagnosed with multiple STIs during their lifetime. Each of these four women reported an infection with BV. The most commonly reported STI among lesbian and bisexual college women was HPV/genital warts, with nearly 4.0% of respondents being diagnosed with this STI.

Sexual Behaviors and Number of Sex Partners Among Women Reporting an STI Diagnosis

HPV, BV, and genital herpes accounted for 84.2% of the STI cases among lesbian and bisexual college women in this investigation. Moreover, 84% of college women with an STI diagnosis had engaged in penile–vaginal intercourse and 42% had engaged in anal receptive intercourse with a man during their lifetime. However, four women with an STI diagnosis never engaged in either of these behaviors.

Lesbian and bisexual college women with an STI diagnosis had significantly more total sex partners and male sex partners (during their lifetime and past 3 months) than women who did not have an STI diagnosis (Figure 3). No significant differences in STI diagnosis were reported among lesbian and bisexual college women based on age, age they “came out,” age of first sex, age of first same sex, sexual

FIGURE 3. Mean Number of Total Sex Partners and Male Sex Partners (Lifetime and Past 3 Months) by STI Diagnosis



orientation/attraction, masculinity/femininity, ever being forced to have sex, or number of female sex partners (lifetime or past 3 months).

Results from a logistic regression analysis revealed that only one variable, number of lifetime sex partners, was significantly ($p < .001$) associated with an STI diagnosis among lesbian and bisexual college women. Specifically, women who had more sex partners during their lifetime were 1.32 times (95% CI: 1.14–1.53) more likely to have an STI than women who had fewer sex partners.

A multiple linear regression analysis was conducted to determine which variables were independently associated with number of lifetime sex partners among lesbian and bisexual college women (Table 4). Older age and ever engaging in penile–vaginal intercourse with a man were positively associated with number of lifetime sex partners among lesbian and bisexual college women. However, older age at first same

sex experience was negatively associated with number of lifetime sex partners among these women. Thus, the older the age at which women had their first same sex experience, the fewer lifetime sex partners they had. Together, these variables accounted for approximately 23% of the variance in the number of lifetime sex partners reported among lesbian and bisexual female college students.

LIMITATIONS

Caution must be exercised when interpreting the results of this investigation. First, this investigation utilized a cross-sectional, rather than longitudinal, study design. Thus, inferences about causation between sexual behaviors and STI diagnoses among lesbian and bisexual college women cannot be made. Second, because the survey targeted self-identified lesbian and bisexual college women who participated in LGBT college student organizations with professionally staffed offices, women who did not have an LGBT organization and/or a professionally staffed office at their institution or who did not participate in their institution's LGBT organization, were not likely to participate in this study.

Third, lesbian and bisexual college women who self-selected to participate in this study may have been different from lesbian and bisexual college women who chose not to participate. It is particularly important to note that most of the

TABLE 4. Predictor Variables for Number of Sex Partners (Lifetime)

Variable	β	SE	t	p
Age	.418	.096	4.354	< .001
Age first same sex	-.560	.170	-3.300	.001
Ever engaged in penile–vaginal intercourse	3.751	.745	5.038	< .001

Note. R^2 (adjusted) = .233. $F(3,148) = 16.254$. $p < .001$.

college women who participated in this survey were White; fewer racial and/or ethnic minority lesbian and bisexual college women participated. Moreover, participation in the survey required access to and skills for using a computer and/or the Internet. Students without access to a computer or the Internet or who did not have computer skills were less likely to participate. Thus, results regarding the sexual behaviors and STIs of lesbian and bisexual college women in this investigation cannot be generalized to all lesbian and bisexual college women, to all lesbian and bisexual college women who participate in LGBT student organizations, or to lesbian and bisexual college women of different racial and/or ethnic groups.

Although placing the survey instrument online had numerous advantages over a paper and pencil survey format, including less expense for researchers and increased accessibility and anonymity for participants, it also had its disadvantages. For instance, providing increased anonymity in completing the survey may have increased the likelihood that students took the survey on more than one occasion or that individuals who were not female college students and/or who did not have a lesbian or bisexual identity completed the survey. These limitations exist for most investigations utilizing the Internet as a means of data collection ([Mustanski, 2001](#); [Nicholson et al., 1999](#)).

Lastly, due to the extreme length of the questionnaire (275 items), only 230 female respondents completed the entire survey. A larger number of women to complete the survey would have certainly aided in strengthening the validity and generalizability of survey results. However, to provide a comprehensive overview of lesbian and bisexual college women's sexual behavior and STI risk, additional research is needed. In particular, longitudinal and/or qualitative research should be conducted, as well as research that examines sexual behaviors and STI risk among lesbian and bisexual college women of color.

DISCUSSION

As mentioned earlier, the majority of lesbian and bisexual college women in this investigation

first became aware of their same-sex sexual attraction and "came out" regarding their sexual orientation between the ages of 10 and 18 years, most likely when they were in middle or high school. However, more than a third of these women did not "come out" until the age of 18 years or older, most likely when they were in college. These are important facts of which both secondary school and college health professionals should be made aware and prepared to address at their institutions.

Specifically, secondary school and college health professionals must be prepared to address numerous potential challenges that could arise among lesbian and bisexual female students, including increased isolation from family and/or friends, depression, and/or verbal and physical harassment, as they recognize their sexual orientation and disclose it to others ([D'Augelli & Hershberger, 1993](#); [Floyd & Stein, 2002](#); [Maguen, Floyd, Bakeman, & Armistead, 2002](#); [Rotheram-Borus & Fernandez, 1995](#); [Savin-Williams, 1994](#)). In addition, health and education professionals must address the sexual health and STI concerns of lesbian and bisexual female students at younger ages. As demonstrated in this investigation, the earlier the age at which these women "came out," the earlier they initiated both opposite- and same-sex sexual behaviors. As with heterosexual youth, younger lesbian and bisexual women must be educated about the different STIs, the benefits of postponing sexual involvement, and ways in which they can reduce their risk of infection.

A wide distribution was reported across sexual attraction categories among female college students in this investigation. Only one-third of self-identified lesbian and bisexual college women reported being "exclusively sexually attracted to females." These results were consistent with other investigations in which lesbian and bisexual women reported nonexclusive sexual attractions ([Floyd & Stein, 2002](#); [Laumann et al., 1994](#); [Maguen et al., 2002](#); [Russell & Seif, 2002](#)). However, because this was a homogeneous sample of mostly White women, additional research must be conducted to determine the degree to which different racial/ethnic populations of lesbian and bisexual college women are

sexually attracted to persons of the same and/or opposite sex and to what extent, if any, these attractions are associated with their sexual behavior and/or STI risk.

As in previous research with other populations of WSW, lesbian and bisexual female college students in this investigation engaged in oral sex, vaginal fingering, and mutual masturbation, and used a dildo or vibrator on a sex partner most frequently (Bailey et al., 2003; Diamant et al., 2000). Moreover, the percent of lesbian and bisexual college women who had ever engaged in penile–vaginal sex (56%) was consistent with previous reports of this behavior among other groups of WSW (Bailey et al., 2003; Bailey et al., 2003; Carroll et al., 1997; Diamant et al., 2000; Einhorn & Polgar, 1994; Laumann et al., 1994; Marrazzo, 2000; Marrazzo et al., 1998; Marrazzo et al., 2001; Marrazzo et al., 2003; Morrow & Allsworth, 2000). Unfortunately, very few college women in this investigation used condoms, dental dams, or other barriers consistently or during their last sex; thus, placing them at risk of acquiring an STI. This was especially true among women whose sex partners were predominately or entirely female.

To help eliminate the perception of “invulnerability” to infection, lesbian and bisexual women must be explicitly informed through multiple, reliable, and credible health and LGBT sources that STIs can be transmitted between women. Moreover, lesbian and bisexual women need to understand exactly how different STIs can be transmitted between women, especially during the types of sexual behaviors in which they most frequently engage. Explicit instruction in how to reduce their risk for STIs, including the importance of cleaning sex toys between use, not sharing sex toys, and using latex gloves and/or dams, must be reiterated.

Although significant differences were reported in the number of and sex of sex partners among lesbian and bisexual college women based on their sexual attraction and self-described masculinity/femininity, no significant differences were reported based on these characteristics in their total number of lifetime sex partners. It was this last factor, number of lifetime sex partners, that was significantly associated with an STI diagnosis among this population.

Thus, lesbian and bisexual college women need to understand that the more sex partners they have, regardless of their partners' sex, the greater their risk for an STI. However, before limiting STI prevention for lesbian and bisexual college women to this simplistic message, additional research must be conducted to further understand STI transmission between women. In addition, the relationship between STI risk and other factors, such as concurrency of sex partners, drug and/or alcohol use prior to or during sex, and past experiences with sexual abuse among lesbian and bisexual college women, must be explored.

Although the percent of lesbian and bisexual college women diagnosed with an STI in this investigation was lower than that reported in previous investigations of WSW, it is important to note that these were self-reported cases of STIs. No exams or lab tests were conducted with these women to detect current infections. Moreover, because previous research has demonstrated that most WSW have no idea that they have an infection (Marrazzo, 2000; Marrazzo et al., 1998; Marrazzo et al., 2001; Marrazzo et al., 2003), it is possible that more women in this investigation had an undiagnosed STI. Regardless of the actual numbers, it is vital that young lesbian and bisexual women are made aware of the asymptomatic nature of many STIs, the association between STIs and HIV, and the importance of regular pelvic exams, including Pap tests. Furthermore, educational efforts targeting lesbian and bisexual college women must include information about HPV, genital herpes, and BV, which were the most common STIs reported among these women.

Last, college and other health professionals must be educated about these issues so that they can inform and effectively care for their lesbian and bisexual female patients. To do this, health professionals must first free themselves from stereotypes and/or from using overly simplistic labels when working with lesbian and bisexual women. They must learn to recognize and appreciate all of the nuances within women's sexual attractions, identities, and behaviors. Professionals should not, for example, automatically assume that lesbians do not have sex with men, nor should they assume that women with an STI were infected by a male partner. As

demonstrated in this investigation, lesbian and bisexual college women are quite diverse and engage in a variety of sexual behaviors that place them at risk for an STI.

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