

Sexual Orientation and Health

Comparisons in the Women's Health Initiative Sample

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Context: Little is known about older lesbian and bisexual women. Existing research rarely compares characteristics of these women with comparable heterosexual women.

Objective: To compare heterosexual and nonheterosexual women 50 to 79 years on specific demographic characteristics, psychosocial risk factors, screening practices, and other health-related behaviors associated with increased risk for developing particular diseases or disease outcomes.

Design: Analysis of data from 93 311 participants in the Women's Health Initiative (WHI) study of health in postmenopausal women, comparing characteristics of 5 groups: heterosexuals, bisexuals, lifetime lesbians, adult lesbians, and those who never had sex as an adult.

Setting: Subjects were recruited at 40 WHI study centers nationwide representing a range of geographic and ethnic diversity.

Participants: Postmenopausal women aged 50 to 79 years who met WHI eligibility criteria, signed an informed consent to participate in the WHI clinical trial(s) or observational study, and responded to the baseline questions on sexual orientation.

Main Outcome Measures: Demographic character-

istics, psychosocial risk factors, recency of screening tests, and other health-related behaviors as assessed on the WHI baseline questionnaire.

Results: Although of higher socioeconomic status than the heterosexuals, the lesbian and bisexual women more often used alcohol and cigarettes, exhibited other risk factors for reproductive cancers and cardiovascular disease, and scored lower on measures of mental health and social support. Notable is the 35% of lesbians and 81% of bisexual women who have been pregnant. Women reporting that they never had sex as an adult had lower rates of Papanicolaou screening and hormone replacement therapy use than other groups.

Conclusions: This sample of older lesbian and bisexual women from WHI shows many of the same health behaviors, demographic, and psychosocial risk factors reported in the literature for their younger counterparts, despite their higher socioeconomic status and access to health care. The lower rates of recommended screening services and higher prevalence of obesity, smoking, alcohol use, and lower intake of fruit and vegetables among these women compared with heterosexual women indicate unmet needs that require effective interactions between care providers and nonheterosexual women.

Arch Fam Med. 2000;9:843-853

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THE STUDY of diverse sexual orientations and associated health outcomes is emerging as an important research area that can provide scientific information about health risks to guide clinician-patient discussions about care needs. With the recent inclusion of questions about sexual orientation and behavior in population-based studies, the importance of sexual orientation to health can be illuminated. Understanding any differences could contribute to improving interventions for these

groups and provide direction for future research efforts.

Previous surveys of lesbian and bisexual women, generally based on samples obtained via lesbian organizations, social venues, newspapers, counseling centers, and community networks, have suggested that nonheterosexual women may exhibit differences, compared with heterosexual women, in health-related behaviors that could increase their risk for developing particular diseases. Respondents to these surveys have largely been younger than 35 years, college-educated,

MATERIALS AND METHODS

DESIGN OF THE WHI

The WHI is a cluster of studies designed to investigate disease outcomes in older women.²⁴ Participants were recruited through 40 clinical centers around the United States representing a range of geographic and ethnic diversity. The WHI is composed of 3 randomized clinical trials and a longitudinal observational study. The randomized trials include a test of an intensive dietary intervention that reduces consumption of fat and increases intake of fruits, vegetables, and grains to reduce breast cancer rates, a test of hormone replacement therapy to reduce cardiovascular disease, and a test of calcium/vitamin D to reduce fracture rates.²⁵ Data collected from women include questionnaire and interview data, physical examination findings, and laboratory data. Women in the WHI participate in annual clinic visits or mailed follow-up questionnaires for up to 12 years. All sites have appropriate institutional review board approval of the project.

WHI Recruitment Procedures

Women were alerted to the WHI in multiple ways: through direct unsolicited mailings, through public notices and newspaper articles, through electronic media, and through community and medical sources. Potential participants notified the clinical center of their interest and participated in an initial eligibility screen, frequently by telephone. Women meeting the basic eligibility requirements came to an initial screening visit at the clinical center. Study staff obtained further eligibility data and baseline data applicable to all of the WHI components. Women eligible for one of the clinical trials were invited to a second screening visit that included both clinical and questionnaire data collection. At the third visit women were randomized into the appropriate trial(s). Women ineligible for the randomized trials were invited to participate in the observational study, which collected baseline and 3-year data at clinic visits and questionnaire data only during the other years of the study.²⁵

Eligibility Requirements

The general WHI eligibility criteria are broad, in order to increase the generalizability of the study findings. Inclusion criteria include ages 50 to 79 years, postmenopausal status, likely residence in the study area for at least 3 years after enrollment, and written informed consent. Exclusion criteria include report of a health risk with predicted survival of less than 3 years, staff judgment of inability to follow the protocol requirements, and active current participation in any other randomized trial. Other eligibility

criteria vary for each clinical trial, depending on the needs and outcomes of the specific trials.²⁵

For the present analysis, we drew a sample of all 96 007 women randomized into the clinical trials or enrolled in the observational study by February 28, 1997. These 96 007 women represent 59.3% of the final WHI sample of 161 859 (recruitment ended in December 1998). We then excluded the 2696 women who checked "prefer not to answer," leaving a final analysis sample of 93 311 women who answered the baseline question about lifetime sexual partners.

MEASURES

Participants provided data on a wide range of variables. The questions to measure these variables were designed by a working group composed of trial investigators and staff, and were based on questions used in other long-term health and disease outcome trials.

Sexual Orientation

There is a dearth of literature on the best measures for sexual orientation in women. Therefore, we created measures of the sex of lifetime and recent sexual partner(s) for the baseline instrument. These questions were embedded as one of many questions, potentially lessening the difficulties of disclosure. We asked the following question: "Regardless of whether you are currently sexually active, which response best describes who you have had sex with over your adult lifetime?" Response categories included "have never had sex," "sex with a woman or with women," "sex with a man or with men," "sex with both men and women," and "prefer not to answer." If participants checked the "with both men and women" answer, they responded to a second question: "Which response best describes who you have had sex with after 45 years of age?" with the same response categories, excluding the "no sex" answer category. We grouped women into 5 sexual orientation groups based on their responses: heterosexual, bisexual, lifetime lesbian (sex only with women ever), adult lesbian (sex only with women after age 45 years), and never had adult sex, deleting the "prefer not to respond" group from data presented in this article.

Demographic Variables

Data were gathered to assess ethnicity, educational level, occupation, and age, which was calculated from the participant's birth date.

Psychosocial Factors

Depression was measured with the short Center for Epidemiological Studies–Depression Scale, a 9-item scale widely used to screen for depression. Normative values and

clinical cutoffs are available in the literature.²⁶ An algorithm score greater than 0.06 was used as an indicator of depression.

Emotional well-being, social functioning, and general health perceptions were measured using the Mental Health and General Health subscales of the RAND 36-Item Health Survey.²⁷ For multivariate analyses, we categorized the continuous values of these subscales into categories based on the mean and SD in this sample and ranked from low to high. Well-being categories were as follows: 0 to 63 (low), 64 to 78, 79 to 93, and 94 or more (high). Social functioning was categorized as follows: 0 to less than 72 (low), 72 to less than 90, and 90 or more (high).

Quality of life was measured by asking, "Overall, how would you rate your quality of life?" and "How satisfied are you with your quality of life?" with response categories of 0 to 10. For multivariate analyses, we categorized the continuous value of quality of life into 4 categories based on the distribution around the mean as less than 6.7 (low), 6.7 to 8.1, 8.2 to 9.6, and 9.7 or more (high).

Social support was measured using the MOS Social Support Survey, a 9-item scale with 5 response categories for each item.²⁸ Widely used, including for studies of older women, this instrument measured the functional components of social support. Scores for the 9 items were summed to form a single social support scale.

Medical Care and Access

We obtained information on whether women had health insurance and if it was prepaid, private, or public. We also ascertained whether the woman had a regular provider of care. Mammography, Papanicolaou smear, and Hemocult screening were measured, asking the women if they had each service and, for positive responses, the date of the last screening test. Health care related to reproductive health assessed use of birth control, frequency of pregnancy, and childbirth, having a hysterectomy, and use of hormone replacement therapy.

Disease History

History of medical conditions was assessed by whether a physician ever told the woman she had any of the diseases on a specified list of conditions, including cancer, hypertension or high blood pressure, stroke, myocardial infarction, asthma, and migraine headaches, or underwent a hysterectomy.

Health Behaviors

Nutrient intake and daily servings of fruits and vegetables was measured by the Food Frequency Questionnaire, a self-administered form widely used to measure dietary intake in large samples that asks about usual frequency of

consumption and portion sizes from a fixed list of foods.²⁹ For multivariate analyses, we categorized the continuous value of daily fruit/vegetable servings into 4 categories based on means and SDs in the sample: fewer than 2 servings, 2 to 3 servings, 4 to 5 servings, and more than 6 servings.

Smoking status was measured by asking whether the participant ever smoked at least 100 cigarettes and whether the participant currently smoked cigarettes. Alcohol consumption was measured using a set of questions about past and current alcohol consumption. Frequency and amount of consumption for current drinkers was measured using responses about frequency of beer, wine, and liquor consumption from the Food Frequency Questionnaire. We measured physical activity with questions about frequency and duration of walking at various speeds and of strenuous and moderate exercise, then calculated the number of episodes per week of fairly or very fast walking or of strenuous or moderate exercise that were 20 or more minutes in duration.

Height and weight were both measured by clinical center staff at the screening visit, using a calibrated standard scale and without outdoor clothing. Body mass index was calculated as weight in kilograms divided by the square of the height in meters. Women were classified as overweight or obese if their body mass index was greater than or equal to 27.3 kg/m², which is the definition used in the *Surgeon General's Report on Nutrition and Health*.³⁰

ANALYSIS PLAN

We conducted descriptive analyses to compare the 5 sexual orientation groups on the demographic characteristics, preventive health behaviors, screening behaviors, reproductive health care factors, psychosocial risk factors, and health conditions. To compare prevalence of health conditions, screening, and health behaviors, we present age-standardized distributions. We used age standardization, since the distribution of age differed among the sexual orientation groups, health condition incidence is highly associated with age, recommendations for frequency of screening differ by age, and many health behaviors differ for older and younger women. The age-adjusted percentages were calculated using the method of direct standardization with the total WHI population age distribution, age 50 to 59 years (39.4%), 60 to 69 years (39.8%), 70 to 79 (19.5%) as the standard population.³¹

To examine factors associated with sexual minority (lesbian/bisexual) status in the multivariate analyses, the bisexuals, adult lesbians, and lifetime lesbians were combined into a single group, which was compared with heterosexuals. The "prefer not to answer" and "no adult sex" groups were not included in these analyses. We first ran a logistic regression model for each of the variables listed in **Tables 1, 2, 3, 4, 5, and 6**. For the final multivariate model, we entered all those variables significant in one of the initial models. In all regression models we controlled for clinical center.

Table 1. Characteristics of Sample by Sexual Orientation Group*

	Sexual Orientation, %†				
	No Adult Sex (n = 1420)	Heterosexual (n = 90 578)	Bisexual (n = 740)	Lifetime Lesbian (n = 264)	Adult Lesbian (n = 309)
Age at enrollment, y, mean ± SD	64.8 ± 7.4	62.3 ± 7.4	59.7 ± 7.0	59.4 ± 7.4	56.7 ± 5.6
Ethnicity					
White	85.8	84.6	85.0	85.2	90.0
Black	3.1	8.5	8.6	7.2	6.2
Hispanic	4.2	3.1	3.4	3.4	2.6
Other	7.0	3.8	3.0	4.2	1.3
Education					
0-11 years	4.6	4.6	4.0	4.6	2.3
High school diploma/GED test	10.2	16.7	8.4	7.3	3.6
Some college/technical training	19.5	38.2	26.2	25.2	22.1
College graduate	10.5	11.3	9.3	10.7	8.5
Graduate school	55.2	29.2	52.2	52.3	63.5
Job SES					
Managerial/professional	63.5	41.9	58.9	62.7	68.3
Technical/sales/administrative	20.2	30.0	19.9	15.0	14.9
Service/labor	12.8	16.9	16.8	18.1	14.5
Homemaker only	3.5	11.1	4.4	4.2	2.3
Insurance (age <65 y)					
None	10.2	6.8	12.0	10.4	9.7
Prepaid only	42.4	46.6	52.1	48.9	55.9
Private only	47.5	46.6	35.9	40.7	34.4
Insurance, age (≥65 y)					
Prepaid and Medicare	21.5	26.2	33.3	33.3	42.1
Private and Medicare	58.0	56.0	52.5	47.2	42.1
Medicare only	20.5	17.8	14.2	19.4	15.8
Has health care provider	93.2	93.9	92.9	91.9	91.9

*GED indicates General Educational Development; SES, socioeconomic status.

†Unless otherwise indicated.

Table 2. Preventive Health Behaviors by Sexual Orientation*

Characteristic	Sexual Orientation, %				
	No Adult Sex	Heterosexual	Bisexual	Lifetime Lesbian	Adult Lesbian
Recency of Papanicolaou tests†					
≤1 y	53.6	67.2	61.0	61.7	66.8
13-36 mo	24.3	22.6	25.3	21.8	20.1
>36 mo	15.6	9.5	11.8	15.0	13.1
Never	6.4	0.8	1.9	1.5	0.0
Recency of mammogram					
≤1 y	65.2	66.7	65.2	62.6	69.8
13-24 mo	15.5	17.1	16.6	21.6	17.1
>24 mo	13.3	12.7	13.7	12.4	10.2
Never	6.1	3.5	4.5	3.4	2.8
Recency of Hemocult					
<5 y	56.6	56.7	61.0	58.8	60.0
≥5 y	20.2	18.4	17.6	21.6	23.1
Never	23.2	24.9	21.5	19.6	17.0

*Data are age-adjusted.

†Women who underwent hysterectomies were deleted from the data on Papanicolaou tests.

and white. Their mean household income has been lower than that of comparable heterosexual women.

These surveys have reported on health behaviors, including tobacco and alcohol use, obesity, and access to medi-

cal care. Tobacco use, assessed in 2 convenience samples, was higher among lesbians than among the general female population.^{1,2} Alcohol use in a survey of a random sample of San Francisco, Calif, households, which used 6-

Table 3. Health Behaviors by Sexual Orientation Group*

Characteristic	Sexual Orientation, %†				
	No Adult Sex	Heterosexual	Bisexual	Lifetime Lesbian	Adult Lesbian
Percentage of energy from fat, mean ± SD	32.7 ± 5.0	33.3 ± 5.1	32.9 ± 5.4	33.1 ± 5.6	32.8 ± 5.4
Fruit/vegetable servings per day, mean ± SD	4.0 ± 1.3	4.1 ± 1.2	4.2 ± 1.4	3.9 ± 1.3	3.9 ± 1.2
Smoking status					
Never smoked	68.2	50.0	32.0	36.5	30.0
Past smoker	26.9	42.8	56.1	53.5	55.7
Current smoker	5.0	7.2	12.0	10.0	14.4
Alcohol use					
Nondrinker	18.6	9.9	5.0	7.1	1.1
Past drinker	16.5	18.2	20.8	19.6	24.3
<1 drink/wk	37.2	33.3	26.6	29.0	32.1
1-7 drinks/wk	19.7	26.6	28.4	30.4	23.9
≥7 drinks/wk	8.0	12.0	19.1	14.0	18.5
Overweight or obese	50.2	45.6	47.5	51.1	50.9
Moderate to strenuous activity					
None	26.7	19.3	18.9	17.4	18.9
Some	39.0	35.8	30.9	38.2	37.9
2-3 episodes/wk	14.9	18.1	17.1	14.2	21.6
≥4 episodes/wk	19.4	26.9	33.1	30.3	21.6

*Data are age-adjusted.
†Unless otherwise indicated.

Table 4. Psychosocial Characteristics by Sexual Orientation Group*†

Characteristic	Sexual Orientation, Mean ± SD‡				
	No Adult Sex	Heterosexual	Bisexual	Lifetime Lesbian	Adult Lesbian
Depressed, %	8.3	11.1	15.4	16.5	15.0
Social support score	34.1 ± 8.2	36.1 ± 7.7	35.2 ± 7.9	36.6 ± 7.7	37.6 ± 7.3
QOL score§	8.1 ± 1.5	8.2 ± 1.5	7.9 ± 1.6	8.0 ± 1.5	8.2 ± 1.4
Satisfaction with QOL	8.1 ± 1.9	8.0 ± 1.9	7.6 ± 2.2	7.8 ± 1.9	7.9 ± 2.0
Emotional well-being	79.8 ± 14.8	78.7 ± 14.5	76.8 ± 15.5	77.8 ± 14.7	77.4 ± 14.1
Social function score	89.1 ± 18.3	90.0 ± 17.8	86.4 ± 20.5	88.2 ± 20.2	86.0 ± 21.1

*QOL indicates quality of life.
†Data are unadjusted. Age adjustment does not change the results.
‡Unless otherwise indicated.
§For the QOL score, 0 indicated worst, 10, best.

categories of alcohol use, showed no difference in current alcohol use between lesbian and heterosexual female respondents. However, more lesbians reported being recovering alcoholics (13% vs 3% in heterosexual female respondents).³ Smaller samples collected through bars and counseling centers revealed higher rates of alcoholism (14%-32%) in lesbians than among heterosexual women.⁴⁻⁷

Reports on acute and chronic medical problems have focused on sexually transmitted diseases, cervical dysplasia, cancer, and depression among self-identified lesbians. A history of sexually transmitted diseases was rarely reported in an early survey of gynecologic problems.⁸ Although *Trichomonas* infection has been reported during exclusive lesbian sexual activity, in general, sexually transmitted diseases have been associated with heterosexual

activity.⁸⁻¹⁰ While this suggests an overall lower sexually transmitted disease risk for lesbians, it should be noted that as many as 80% of the lesbian respondents in several studies have a history of heterosexual intercourse.^{1,8} Lower rates of cervical dysplasia have been reported^{8,9} with at least 1 case of cervical intraepithelial neoplasm in a woman without prior heterosexual intercourse, but whose partner had a history of heterosexual intercourse.¹¹ Anecdotally, there is concern that lesbians may experience more breast cancer, cardiovascular disease, and diabetes, since surveys suggest higher rates of nulliparity,^{4,12-14} higher body mass index,¹⁵ and fewer other reproductive behaviors associated in epidemiologic studies with protection from various reproductive system cancers (eg, use of oral contraceptives, breast-

Table 5. Baseline Data on Reproductive Characteristics*†

	Sexual Orientation, %				
	No Adult Sex	Heterosexual	Bisexual	Lifetime Lesbian	Adult Lesbian
Age at first OC use, y	9.3	45.4	54.6	26.5	52.1
<25	1.7	13.2	23.5	11.4	24.6
25-34	4.6	32.1	41.6	16.7	42.4
≥35	4.5	21.8	21.4	8.0	11.0
HRT use ever	48.0	67.7	66.7	65.9	71.1
Never pregnant	90.4	7.6	19.2	65.0	37.0
Hysterectomy	29.3	41.5	39.6	35.7	35.0

*OC indicates oral contraceptive; HRT, hormone replacement therapy.
†Unadjusted data. Age adjustment does not change results.

Table 6. Age-Standardized Prevalence of Health Conditions by Sexual Orientation

Condition	Sexual Orientation, %				
	No Adult Sex	Heterosexual	Bisexual	Lifetime Lesbian	Adult Lesbian
Any cancer	14.1	11.9	17.6	14.1	12.4
Breast	6.4	4.9	8.4	5.8	7.0
Colon	0.9	0.8	0.8	2.1	0.3
Endometrial	2.1	1.8	1.6	0.0	1.5
Cervical	0.4	1.3	2.1	2.2	0.0
Myocardial infarction	1.9	2.0	1.2	3.1	4.3
Angina	4.8	5.1	4.9	4.2	7.1
Hypertension	36.0	31.6	32.1	30.3	30.0
Stroke	1.5	1.2	1.8	1.0	0.5
Asthma	8.1	7.6	8.7	11.9	7.2
Migraines	10.0	11.5	11.8	11.2	12.4
Hysterectomy	29.1	41.5	39.2	35.8	39.4

feeding, and childbirth).^{16,17} Unfortunately, rates of these diseases have not been compared.

Surveys have also suggested that lesbians may experience higher rates of depression^{18,19} and lower rates of social support, with friends providing more and family providing less support than in the heterosexual population.²⁰ A survey of 142 lesbians recruited through a national lesbian publication found that work discrimination and family relationship issues relating to lifestyle were major sources of stress.²¹ Domestic violence may also be an issue, but most studies have focused on factors associated with frequency and severity of battering episodes in populations of lesbians who have self-identified as having been in an abusive relationship.^{22,23} In a mail survey of members of a lesbian organization in a southwestern city, 37% of respondents reported being in or having been in an abusive relationship.¹⁸

Avoidance of medical care among lesbians is correlated with negative experiences with medical care providers and lack of insurance.¹ Intervals between episodes of routine gynecologic care seem to be longer in lesbian populations.⁹ Practicing physicians rarely address the issue of sexual orientation and, when the issue is raised, physicians lack information on how it specifically affects disease risk. For example, many health care providers erroneously believe that lesbians do not need cervical cancer screening.²³

One way to address the methodological limitations of previous studies is to recruit women of diverse sexual orientations in comparable and confidential ways, insuring that the samples do not have differential bias and that women feel relatively comfortable disclosing their sexual orientation to researchers. This article reports on relationships of sexual orientation with disease risk factors, use of health care services, health behaviors, and psychosocial status in the large sample of women participating in the clinical trial and observational study cohorts of the Women's Health Initiative (WHI). This sample offers ethnic and geographic diversity and a range of ages not previously seen in studies of sexual orientation and health. The objectives of this analysis were to (1) describe the prevalence of lesbian and bisexual activity among WHI participants; (2) compare the prevalence of various demographic characteristics, risk behaviors, preventive health practices, psychosocial risk factors, and reproductive and health conditions by sexual orientation; and (3) compare the prevalence (before enrollment) of major cancers and cardiovascular disease by sexual orientation. In addition, we used multivariate models to determine factors associated with lesbian/bisexual status.

RESULTS

PREVALENCE OF NONHETEROSEXUAL ORIENTATION

Of the 93311 women in the analysis sample, most (97.1%) were heterosexuals. Self-identified lesbians represented only 573 (0.6%) of the sample, almost equally divided between lifetime lesbians and those who identified themselves as lesbians only after age 45 years. Bisexuals were 0.8% of the sample. Only 1.5% reported never having had sex as an adult.

CHARACTERISTICS OF SEXUAL ORIENTATION GROUPS

Table 1 compares the distribution of various demographic characteristics for the sexual orientation groups. The modal age at WHI screening was age 60 to 69 years for all but the 2 lesbian groups, who were younger, with a mode of age 50 to 54 years. Mean age at screening was

62.3, ranging from a high of 64.8 in the never had sex as an adult group to a low of 56.7 in the adult lesbian group.

Adult lesbians, lifetime lesbians, bisexuals, and heterosexuals were distributed similarly across ethnic groups, ranging from 85% non-Hispanic white in the heterosexual group, to a high of 90% non-Hispanic white in the adult lesbian group. Compared with these groups, those reporting no adult sex were slightly less likely to be black and more likely to be Hispanic and "other."

The percentage of individuals with graduate education was highest for the adult lesbians at 63%, but also high for bisexuals and lifetime lesbians (52% each) and women reporting no adult sex (55%). Job socioeconomic rankings reflected the same patterns, with a majority of women among the 2 lesbian groups, the bisexuals, and those reporting no adult sex indicating managerial/professional jobs.

FACTORS ASSOCIATED WITH ACCESS TO AND USE OF HEALTH CARE

In the younger than 65 years groups, heterosexuals were the most likely to have health insurance (Table 1). Among the heterosexuals, women who had insurance were almost equally divided between prepaid vs private insurance. In all of the other groups except the no adult sex group, prepaid insurance was more common than private insurance. Among women older than 65 years, most women had either private or prepaid insurance in addition to Medicare. More than 90% of women in all groups reported having health care providers.

Table 2 shows the age-adjusted distribution of use of screening services for the 5 sexual orientation groups. Patterns varied by test. For Papanicolaou tests, between 54% and 67% of women across the groups had had a test in the past year, and 0% to 6% had never had the test. The no adult sex group were the least likely to have had a test in the last year. Heterosexuals were most likely to have been tested in the last year, followed closely by the adult lesbian group. Next were the lifetime lesbian and the bisexual groups, who had slightly lower, but similar rates, at 62% and 61%, respectively. The unadjusted data showed essentially the same range of percentages.

The age-adjusted rate for mammograms in the past year was the highest among the adult lesbians, at 70%, compared with 63% to 67% for women in the other groups. Again, the unadjusted rates were similar and showed that only between 3% and 7% across the groups had never had a mammogram. There was little variation among groups on recency of Hemocult.

HEALTH BEHAVIORS

Health behaviors often associated with disease risk are shown in Table 3. These data are age-adjusted. The sexual

orientation groups differed little on percentage of energy from fat or daily fruit and vegetable servings. Compared with heterosexuals, from 2% to 7% more women in the other groups were overweight or obese.

The no adult sex group had a considerably higher percentage reporting little or no exercise compared with the other groups; 66% of women in this group report exercising fewer than 2 times per week, compared with a range of 50% to 57% of women in the other groups. Smoking and alcohol use varied considerably more. The 2 lesbian groups and the bisexual women had the lowest rate of never smoking and were more likely to be current smokers. They were also the most likely to use alcohol and to use more of it. The no adult sex group was the least likely to have ever smoked (32%). This latter group was also the least likely to have used alcohol. The data show the same picture when not adjusted for age.

PSYCHOLOGICAL CHARACTERISTICS

Table 4 shows the unadjusted descriptive data for the psychosocial measures, comparing all categories of sexual orientation. Lifetime lesbians, bisexuals, and adult lesbians were more likely to be depressed than the other 2 groups, with unadjusted percentages ranging from 15% to 17%. The no adult sex group had the fewest women who scored positive on depression (8%). Eleven percent of heterosexuals were depressed. Social support scores were within a range of 34 to 38, with the lowest scores among the no adult sex group. Quality of life scores were fairly tightly clustered (range, 7.6-8.1), while satisfaction with quality of life was somewhat lower for the lesbian and bisexual groups. In the initial multivariate logistic regressions, social support and quality of life were significantly associated with being in the never had adult sex and bisexual groups. Depression was associated with being in the 2 lesbian and the bisexual groups.

HEALTH CONDITIONS

Table 5 presents unadjusted data for comparisons among orientation groupings for reproductive factors. Not surprisingly, the no adult sex group was the least likely to have ever used oral contraceptives and least likely to have had a hysterectomy. The rate of oral contraceptive use was highest for the bisexuals (55%). Heterosexuals had the highest rate of hysterectomy (42%). The 2 lesbian groups, the bisexuals, and the heterosexual group had similar rates of ever using hormone replacement therapy (66%-71%), higher than use by the no adult sex group (48%). Notable are the high rates of ever being pregnant among the bisexuals (80.8%), adult lesbians (63%), and lifetime lesbians (35%).

Table 6 presents prevalence of various health conditions for the sexual orientation groups, age standardized

to adjust for the differences in the age distribution of the groups. There were differences in reported cancer diagnoses among the groups. Fourteen percent of the no adult sex group and lifetime lesbians and 17.6% of the bisexuals reported ever having had any cancer, compared with 11.9% for heterosexual women. The bisexual group also had the highest rates of breast cancer (8.4%). In fact, all of the non-heterosexual groups had higher rates of breast cancer than did heterosexuals. Reported rates of endometrial cancer were highest in the no adult sex group, while cervical cancer was higher among bisexual women. Rates of hysterectomy were not substantially lower for lesbians and bisexual women than for heterosexual women, but 12.4% fewer women in the no adult sex group reported a hysterectomy than did heterosexual women.

For the cardiovascular conditions, the 2 lesbian groups had slightly lower prevalence of stroke and hypertension than the other groups, but had the highest rates of myocardial infarction. The no adult sex group had the highest rates of both treated and untreated hypertension. General health scores, however, were quite similar for the heterosexual, bisexual, and 2 lesbian groups (data not shown).

FACTORS ASSOCIATED WITH LESBIAN STATUS

The results of the final multivariate logistic regression model are displayed in **Table 7**. The model includes the variables from Tables 1 through 6 that were significant in their individual models adjusted for clinical center. Odds ratios shown for explanatory variables indicate the odds of being a sexual minority (lesbian/bisexual) attributed to each category relative to the referent level. For example, for the alcohol consumption variable, the odds of being a sexual minority for past drinkers is 1.71, relative to nondrinkers. The odds of being a sexual minority for current drinkers relative to nondrinkers increases as weekly consumption increases (<1 drink/wk, 1.19; 1 to <7 drinks/wk, 1.30; and ≥ 7 drinks/wk, 1.52). Other factors associated with higher odds of being a sexual minority were never or infrequently having a Papanicolaou test, past and current smoking, and being obese, depressed, and nulliparous.

COMMENT

The 1.4% of the sample that reported having had lesbian or bisexual sexual relationships is on the low end of previous projections among US women, which ranged from 1.2% to 4.0% for lifetime prevalence.³²⁻³⁵ This low prevalence could be caused by a number of factors: our recruitment strategies, true lower prevalence among women aged 50 to 79 years than among younger populations, reluctance of this age group to report nonheterosexual status, or lower levels of participation by nonheterosexuals in the WHI study. Since WHI recruitment relied heavily on mail-

ing brochures to women identified from a range of sources, including motor vehicle agencies, voter lists, and health plan members, we think that any major bias in sample representation by sexual orientation would not be caused by the recruitment method, but rather by a decision by the women not to participate in a research study. We know that the WHI cohort differed from the US female population of this age in several relatively predictable ways. The WHI women were better educated than the same-aged women included in the NHANES (National Health and Nutrition Examination Survey) III survey,³⁶ but similar to the educational levels of participants from other recent studies of postmenopausal women.³⁷⁻³⁹ The WHI participants reported fewer medical conditions, like hypertension, physician-induced heart attacks, and undiagnosed hypertension, and reported greater uses of health care services than did the random sample of same-age participants in the National Health Interview Survey,³⁹ reflecting our expectation that women who elect to participate and meet eligibility criteria for long-term clinical trials are healthier than women in general.⁴⁰ While such differences limit the extent to which the data from the WHI can be generalized to the entire US population of similarly aged women, it should not affect the comparisons among women of differing sexual orientations within the WHI sample. Our ability to make this comparison is a major contribution of this study, since other studies describing health behaviors, demographic characteristics, and health status of nonheterosexual groups have often lacked a comparable heterosexual comparison group.

An alternative explanation for the low prevalence of nonheterosexual sexual behavior among sample women could be the reluctance of older women to be forthright about sexual orientation on a questionnaire. This may have been a factor in our study population, since there were 2696 women excluded (2.8% of the original WHI sample) because they preferred not to answer the sexual preference question. It has also been suggested that many individuals in homosexual groups have internalized the negative attitudes of society toward homosexual and bisexual individuals and are, therefore, reluctant to admit publicly to either their sexual behavior preferences or to their homosexual identity.⁴¹ If a large percentage of the "prefer not to answer" group of WHI women were, in fact, lesbian and bisexual, then the differences we found between heterosexuals and the total group (identified and not identified) of lesbian and bisexual women would be magnified, since the "prefer not to answer" group had a higher rate of behavioral risk factors and lack of screening services than did identified lesbian and bisexual women.

If there is a general reticence in this older group of women to discuss sexual matters, then more acceptable methods to determine sexual orientation and history of older women would be helpful, both for research classification and to provide information that would facili-

Table 7. Multivariate Analysis of Predictors of Lesbian/Bisexual Status (1) Compared With Heterosexual Status (0)*

Variable	Odds Ratio (95% CI)	P
Race		
Black	0.72 (0.57-0.91)	.006
Hispanic	0.82 (0.58-1.16)	.26
Other	0.71 (0.50-1.02)	.06
White†	1	
Education		
0-11 years	0.55 (0.39-0.77)	.001
High school diploma	0.35 (0.27-0.45)	<.001
Some college	0.45 (0.38-0.52)	<.001
College graduate	0.54 (0.44-0.66)	<.001
Graduate school†	1	
Occupation		
Technical/sales/administration	0.71 (0.60-0.84)	<.001
Service/labor	1.08 (0.91-1.29)	.36
Homemaker only	0.54 (0.40-0.73)	<.001
Managerial/professional†	1	
Insurance status/age, y		
Prepaid only/<65	0.54 (0.42-0.70)	<.001
Private only/<65	0.46 (0.36-0.60)	<.001
Prepaid Medicare/≥65	0.44 (0.30-0.65)	<.001
Private Medicare/≥65	0.37 (0.26-0.53)	<.001
Medicare only/>65	0.36 (0.23-0.58)	<.001
None/<65†	1	
Have care provider		
Yes	1.11 (0.87-1.41)	.40
No†	1	
Papanicolaou smear		
Never	2.33 (1.21-4.50)	.01
13-36 mo	1.21 (1.00-1.47)	.05
>36 mo	1.69 (1.30-2.21)	<.001
Within year†	1	
Mammogram		
Never	1.10 (0.79-1.52)	.58
13-24 mo	1.05 (0.90-1.24)	.54
>24 mo	0.99 (0.82-1.21)	.96
Within year	1	
Smoking		
Past	1.85 (1.63-2.10)	<.001
Current	2.58 (2.12-3.13)	<.001
Never†	1	
Alcohol consumption		
Past drinker	1.71 (1.26-2.33)	.001

Table 7. Multivariate Analysis of Predictors of Lesbian/Bisexual Status (1) Compared With Heterosexual Status (0)* (cont)

Variable	Odds Ratio (95% CI)	P
Alcohol consumption (cont)		
<1 drink/wk	1.19 (0.88-1.61)	.27
1 to <7 drinks/wk	1.30 (0.96-1.77)	.10
≥7 drinks/wk	1.52 (1.10-2.10)	.01
Nondrinker†	1	
Obesity		
Yes	1.25 (1.11-1.40)	<.001
No†	1	
Depression		
Yes	1.22 (1.01-1.47)	.04
No†	1	
Pregnancy		
None	4.68 (4.13-5.30)	<.001
≥1†	1	
Hysterectomy		
Yes	1.27 (0.96-1.68)	.09
No†	1	
Hypertension		
Yes	1.00 (0.88-1.15)	.97
No†	1	
Asthma		
Yes	1.2 (1.00-1.45)	.05
No†	1	
Fruit/vegetable servings		
<2 servings/d†	1	
2 to <4 servings/d	.86 (0.73-1.01)	.07
4 to <6 servings/d	.77 (0.64-0.93)	.006
≥6 servings/d	.85 (0.69-1.04)	.11
Well-being		
<64, low†	1	
64 to <79	1.12 (0.91-1.37)	.29
79 to <94	1.16 (0.94-1.44)	.16
≥94	.96 (0.69-1.34)	.83
Social functioning		
<72, poor†	1	
72 to <90	.84 (0.70-1.01)	.06
≥90	.70 (0.58-0.83)	<.001
QOL		
<6.7, poor	1	
6.7 to <8.2	1.02 (0.85-1.23)	.81
8.2 to <9.7	1.01 (0.81-1.25)	.93
≥9.7	.97 (0.77-1.24)	.84
Age	.96 (0.95-0.97)	<.001

*CI indicates confidence interval; QOL, quality of life.
†Reference group.

tate providing optimal medical care. In medical care settings, a nonjudgmental question, such as “Do you engage in sexual activity with men, women, both, or neither?” would provide the information a medical care provider needs about sexual behavior in a nonexclusionary, non-threatening way that works for all women, regardless of sexual orientation or age.

Analysis of this sample of older lesbian and bisexual women from the WHI confirms many of the findings in the literature relative to health behaviors and demographic and psychosocial characteristics of lesbian and

bisexual women. Although the demographic characteristics of the lesbians, bisexuals, and women who report never having had sex as an adult are those generally associated with better health (ie, higher education and socioeconomic status) the multivariate analyses confirmed that the lesbian and bisexual women, compared with the heterosexual women, have a somewhat higher rate of engaging in risky health behaviors, such as smoking and heavier alcohol use, consume fewer fruits and vegetables daily, and are more likely to be overweight. These risk factors counter the positive effects of socio-

economic status and education and contribute to higher risk for breast, ovarian, and colon cancer. These women did have higher rates of reporting breast cancer than did heterosexual women. Thus, assessment and intervention of these factors in the medical care setting is an important component of preventive care.

Despite having an identified provider of care and being insured, the lesbian, bisexual, and no adult sex women were less likely than heterosexuals to have recent Papanicolaou tests or mammograms. Regular screening with mammograms and Papanicolaou tests would be especially important in view of the higher rates of breast cancer and cervical cancer.

Even in this healthy volunteer population, we found higher rates of depression among lesbians and bisexuals than among heterosexuals, consistent with findings from previous studies. Poorer mental health could be related to homophobic attitudes of society,⁴² while the lower rates of Papanicolaou tests and mammograms could relate to lack of assessment of these needs by health care providers or to negative experiences with homophobia in the health care system. Patients report negative attitudes from their care providers that began when they revealed their sexual orientation^{12,43} and in one study, 84% of surveyed lesbians reported hesitancy in returning to their physicians' offices for new ailments.⁴⁴ A trusting, supportive provider-patient relationship is essential to obtaining a complete medical history and providing effective health care and counseling to patients.⁴⁵ A nonjudgmental attitude and routine assessment both of screening needs and mental health status during medical visits could improve the quality of care for these women.

For several factors, our findings are not consistent with the literature. Among the WHI sample, hysterectomy is only slightly less common among lesbians and bisexuals than among heterosexuals and there were no significant differences on hormone replacement therapy use. These findings are consistent with the generally high socioeconomic status of the WHI women.

Of the other reproductive factors we examined that are often associated with disease risk, only nulliparity is consistently more common among the lesbian and, to a lesser extent, the bisexual women, compared with the heterosexual women. Many of these women have been pregnant and are in parenting roles. Health care providers need to remember that many of these women are living with partners and have children, so even though the family unit may be nontraditional, including partners in decision-making discussions and remembering the context of the women's lives is important to providing appropriate care.

Comparing 5 sexual orientation subgroups increased the difficulty of focusing our comparisons. However, we made a decision to include the no adult sex group in the bivariate analyses because there is little in the lit-

erature on women who report no adult sexual activity, except for studies of cervical and breast cancer among nuns,⁴⁶⁻⁴⁹ and even less pertaining to this age group of women. These women differed from both the heterosexual and nonheterosexual groups on numerous characteristics. Although they tended to report low levels of smoking and alcohol use, their compliance with recommended screening intervals for breast and cervical cancer was worse than for any of the sexually active subgroups. One might presume that they think that they do not need cervical cancer screening, because of lack of sexual activity, but this explanation would not hold for mammography screening. While their much lower "ever" use of oral contraceptives and lower rates of hysterectomy compared with heterosexual women might be expected, their lower use of hormone replacement therapy is not. That 9.6% of these women reported a pregnancy was surprising and could reflect some inaccuracy in our data. A more likely explanation is that these women classified themselves as "never had sex" because the questions asked about usual patterns of sexual activity as an adult. It is possible that some of these women may have become pregnant through rape, artificial insemination, or teenage sexual activity, data we did not collect. Since family units may not coincide with expectations, assessment of social networks as well as sexual behavior and health care needs will be important in the medical care setting.

Finally, despite the differences among the sexual orientation groups, considerable similarity emerges—for example, despite lower rates of recent breast and cervical cancer screening in some of the groups, a majority of WHI women in all groups had the tests within the recommended time frame. At least among women willing to be part of a study, there was less discrepancy in access to and use of health care services between heterosexuals and nonheterosexuals than previously suspected. Thus, while paying heed to sexual orientation may be important to health care personnel because it identifies risk for specific diseases or behaviors that require counseling intervention,^{50,51} each woman is an individual and care must be individualized. If providers of care can learn to communicate with all women in supportive, nonthreatening ways that permit appropriate assessment and intervention for each woman, then issues of sexual orientation and health become merely another routine consideration for both provider and patient.

Accepted for publication June 21, 2000.

This work was done under contracts for the Women's Health Initiative from the National Institutes of Health, Bethesda, Md.

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