Published in final edited form as:

Contraception. 2011 May ; 83(5): 459–465. doi:10.1016/j.contraception.2010.09.011.

Contraceptive usage patterns in North American medical students

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Abstract

Background—Previous studies indicate that the sexual beliefs and mores of students in medical professions may influence their capacity to care for patients' sexuality and contraception issues. Students also represent a large sample of reproductive-age individuals. In this study, we examined contraceptive usage patterns in North American medical students.

Study Design—Students using online medical student social and information networks enrolled in allopathic and osteopathic medical schools in North America between February and July of 2008 were invited to participate via email and published announcements in an Internet-based survey consisting of a questionnaire that assessed ethnodemographic factors, year in school and sexual history. We also collected information about current use of contraceptive and barrier methods. Descriptive statistics and logistic regression were utilized to analyze responses.

Results—Among our 2269 complete responses, at least one form of contraception was being utilized by 71% of men and 76% of women. Condoms were the most popular form of contraceptive, utilized by 1011 respondents (50% of men and 40% of women). Oral contraceptive pills were the contraceptive of choice for 34% of men and 41% of women. Decreased rates of contraception use were associated with being black or Asian, not being in a relationship and having more sexual dysfunction in female respondents. Students who reported comfort discussing sexual issues with patients were more likely to use effective contraceptive methods themselves. Ten percent of this of sexually active medical students was not currently using contraception.

Conclusions—There are significant differences in contraceptive use based on demographics, even at the highest education levels. The personal contraception choices of medical students may influence their ability to accurately convey information about contraception to their patients. In addition, medical students may personally benefit from improved knowledge of effective contraceptive practices.

Keywords

Contraception; Medical students; Sexuality; Safer sex; Sexually transmitted infections

1. Introduction

Health care providers' understanding and knowledge regarding options for contraception and sexually transmitted disease (STD) prevention have been a topic of interest for many years [1–2]. Despite the importance of this topic to patients, it has been established that both practicing physicians and medical students are often uncomfortable evaluating and counseling patients about contraceptive use and risk reduction [3–5]. Medical students who place a high priority on safer sex practices are more likely to report comfort teaching safer sex practices to their patients [3]. While these data suggest that personal safer sex practices have an impact on a student's ability and willingness to convey such information to patients, it is unclear whether confounding factors related to provider ethnodemographic variables or other sexual beliefs or practices influenced these results.

Medical student education about these topics is important not only for patient care but for the personal reproductive health of the students themselves. The North American medical student population consists of approximately 76,000 persons, most of whom are of reproductive age. The National Survey of Family Growth has published results evaluating the contraception practices of both men and women in the United States; these data provide an excellent measure by which medical students can be compared to their age-matched peers [6].

Our research team recently completed an Internet-based survey of sexuality and contraceptive usage among North American medical students. In this subset analysis, we investigated predictors and associations of contraceptive use in this population. We hypothesized that failure to use contraception or use of ineffective contraception would be associated with definable subject characteristics. These characteristics may be useful to curriculum developers who desire to target learning interventions to better educate students, for both the student's personal health and for the benefit of their future patients.

2. Methods

2.1. Subject enrollment and study approval

We invited North American medical students to participate in an Internet-based survey via postings on the American Medical Student Association (AMSA) list serves, the Student-Doctor Network, and a news story posted on <http://www.medscape.com>. The survey was posted at <http://www.QuestionPro.com> and was available from February 22, 2008, until July 31, 2008. The branching logic feature of this software permitted accurate direction of survey subjects to gender- and relationship-appropriate instruments and questionnaires. Approval for this study was granted by University of California, San Francisco's Committee for Human Research; an official endorsement was also secured from the executive board of the AMSA. To increase subject confidentiality, implied consent was assumed by subject participation in and completion of the survey instrument.

2.2. Main outcome measure

Data on contraceptive usage were collected by subject response to the statement, "Please check the boxes adjacent to any form of contraception/protection you or your partner is currently using." A variety of contraceptive options were listed (Table 2). Subjects were given the option of selecting "none" or "other," in which case they were asked to specify their method in a text box.

Respondents who reported being virgins were not included in the contraceptive use analysis. As shown in Table 1, those who identified as exclusively homosexual made up <10% of the

study population and those with no sexual partner in the previous 6 months made up <20%. We initially calculated contraception usage for all respondents and then just those who identified as being involved in some form of heterosexual relationships and who had had a partner in the previous 6 months. Excluding either or both of these groups did not effectively change the significance of the outcome measures. Furthermore, national data does not stratify for sexual orientation or number of partners and thus we included all nonvirgin respondents in the final results as a means of comparison to national demographic data.

2.3. Predictor variables

The remainder of the survey consisted of questions assessing demographic characteristics including age, ethnicity, relationship status, maternity/paternity, medical school location, year in medical school and several other characteristics. A sexuality survey assessed variables such as sexual orientation, age at first intercourse (if any), number of lifetime and recent partners, and sexual function (as assessed by validated instruments for quantification of sexual dysfunction, detailed below). Students were also asked, “Do you feel that you have received adequate training in medical school to deal with patients’ sexuality and sexual problems in clinical practice?” and “Would you or do you feel comfortable talking to patients about their sexual practices and problems?” Subjects were asked to complete the Center for Epidemiological Studies Depression Scale (CES-D), a validated 20-item instrument designed to assess the presence and severity of depressive symptoms [7]. A CES-D score of 16 was utilized as a cut-off for risk of clinically significant depressive symptoms.

2.4. Quantitative instruments for assessment of sexual dysfunction

Gender-appropriate instruments for the assessment of sexual function were utilized to screen for sexual problems. Male subjects completed the International Index of Erectile Function (IIEF), a 15-item validated instrument for the assessment of five domains of male sexuality (desire, erectile function, intercourse satisfaction, orgasmic function and overall satisfaction) [8]. Female subjects completed the Female Sexual Function Index (FSFI), a 19-item validated instrument for the assessment of six domains of female sexual function (desire, arousal, lubrication, orgasm, satisfaction and pain) [9]. A total score of 26.55 or less on the FSFI (score range 2–36) is typically utilized as a cut-off value for high risk of female sexual dysfunction (FSD), including female sexual arousal disorder, hypoactive sexual desire disorder, female sexual orgasm disorder, dyspareunia/vaginismus and multiple sexual dysfunctions [10].

2.5. Outcome measure

Use or nonuse of contraception was the primary outcome, measured as a binary variable.

2.6. Statistical analysis

Bivariate and multivariate analyses were utilized to assess the association between exposure variables and contraception usage. Exposure variables initially included all demographic variables, including location, state, year in medical school, age, race, gender, sexual preference, sex frequency and partner number, and sexual functioning. A forward stepwise multivariable logistic regression model was developed using variables associated with the primary outcome at a p value < .20. We report odds ratios (ORs) and their 95% confidence intervals (CIs) to estimate the association between subject characteristics and contraception use. Statistical significance was set at p < .05 and all tests were two-sided. STATA 10 (StataCorp, College Station, TX, USA) was used for all analyses.

3. Results

There was a total of 2269 complete responses: 914 from men (mean age $\pm$ SD 25.7 $\pm$ 4.2 years) 1347 from women (mean age $\pm$ SD 25.4 $\pm$ 3.4 years) and 8 from individuals who identified as “other” gendered (Table 1). Results were divided and analyzed by gender. There were 12 types of contraception with >1% usage (Table 2). Condoms were the most popular form of contraceptive, utilized by 1011 respondents (50% of men and 40% of women). Oral contraceptive pills (OCP) were the second most popular form of contraception (34% of men and 41% of women).

Dual methods of contraception were utilized by a significant number of respondents. The most typical combination was condoms and OCPs, which was used by 19% of all respondents, with similar numbers seen for men and women (19.7% and 17.2%, respectively). The second most common combination was male condoms and withdrawal, which was utilized by 6.9% of respondents. A substantial number of our nonvirgin subjects [274 men (29.4%) and 327 women (24.0%)] were not currently utilizing any form of contraception. To determine whether this failure to use contraception was due to sexual abstinence, we excluded subjects who reported no sexual partners over the past 6 months and determined that approximately 10% of this sexually active group was not currently using contraception (Table 3).

3.1. Multivariable analysis

Overall, men were less likely than women to utilize contraception (OR 0.75, 95% CI 0.63–0.91), which was consistent across racial groups. On multivariate analysis, no difference was seen in contraception usage between men and women if they were single, were less than age 24 and greater than age 30 (compared to those aged 25–29), did not have depressive symptoms and had had three or more sexual partners in the last 6 months. Male subjects with partners who were not in the medical field were less likely to use contraception relative to those whose partners were in the medical field (OR 1.9, 95% CI 1.2–3). Having a partner in medicine was not predictive of contraception use in women (OR 1.4, 95% CI 0.93–2.2).

Interestingly, clinical signs of depression was associated with a significantly lower contraception use in men (OR 0.67, 95% CI 0.3–.8), but not in women (OR 0.89, 95% CI 0.67–1.1).

Blacks and Asians were significantly less likely than whites and Hispanics to use contraception (Table 3). The differences remained significant when controlled for gender, depression, age, sexual orientation and relationship. Interestingly, in female subjects, high risk of FSD had complex effects on contraception utilization in women of different racial groups. After controlling for high risk of FSD, black students were equally likely to use contraception as their white and Hispanic peers (OR 0.45, 95% CI 0.08–6.0). However, female Asian students not at high risk for FSD were still less likely to use contraception than their white and Hispanic peers (OR 0.4, 95% CI 0.17–0.94).

Compared to their classmates less than 20 years of age, students aged 20–35 were significantly more likely to use contraception (Table 3), although this difference disappeared when we controlled for relationship status (OR 0.8, 95% CI 0.7–3.4). Notably, our results show a lower likelihood of using contraception when over 35 years of age; however, this difference did not achieve statistical significance (OR 0.4, 95% CI 0.1–1.8). When analyzed by 5-year increments, there was an age-related increase in contraception use for all students (OR 1.2, 95% CI 1.0–1.3).

Individuals who were not in stable sexual relationships were less likely to use contraception when compared to individuals in relationships (Table 3). This observation held when controlled for race, gender and depressive symptoms. When looking at depressive symptoms alone, men with clinical symptoms of depression were less like to use contraception (OR .77, 95% CI 0.63–0.94). This did not hold for women. There was no association either between erectile dysfunction on contraception use.

Women at high risk of FSD were significantly less likely to use contraception relative to women not at high risk for FSD. Further analysis revealed that FSD was related to lower contraception use for heterosexual women (OR 0.39, 95% CI 0.27–0.55) but not for homosexual women (OR 1.3, 95% CI 0.28–6.0). There was no association between risk of FSD and oral contraception use (OR 0.98, 95% CI 0.8–1.2).

Students who reported comfort in discussing sex with patients had higher rates of contraception usage (Table 3). This observation held for all racial groups except Asian students (OR 1.2, 95% CI 0.75–2.1). When controlling for selected characteristics, the association was maintained for students under 30 years of age (OR 2.0, 95% CI 1.4–3.0), students with depressive symptoms (OR 2.0, 95% CI 1.4–2.7), single students (OR 2.0, 95% CI 1.4–2.8) and those identifying as heterosexual (OR 1.7, 95% CI 1.3–2.2). It was not related to partner number or marital status (OR 0.9, 95% CI 0.5–1.5).

Contraception use was not associated with students' opinion of the sexuality training they had received in medical school. This observation held when controlled for race, age, relationship status, depression, sexual function, partner number and comfort discussing sex with patients.

4. Discussion

Recent National Survey of Family Growth data indicates that approximately 70% of men and 61.9% of women of reproductive age in the United States use some form of contraception [6,11] (Table 4). The rate of contraception use in our medical student population was approximately 70% for men and 76% for women. It is suggested from these results that male medical students have contraceptive utilization in line with age-adjusted normative data, but female medical students are more likely to use contraception than their age-matched peers. Medical students older than 35 years of both genders were less likely to use any form of contraception compared to their peers aged 20–35 years. This differs from the general population, in which increasing age predicts lower utilization of contraception in men and higher utilization in women (Table 4).

More common use of contraception among female medical students when compared to their age-matched peers is not particularly surprising given the time commitment pregnancy entails; female physicians have long been known to face challenges in family planning, and the average physician has her first child in residency [12]. In North America, most women enter residency after the age of 25, the mean age of US women completing their first pregnancy [13]. Women with higher levels of education generally seek more contraceptive services and have lower rates of fertility compared to women of lesser education achievement [11,14]. Our data certainly supports this assertion as our subjects are among the most educated men and women in North America.

Race was predictive of differences in contraceptive usage in our medical student population. The association of race is very important and could be influenced by a number of factors, including cultural, economic and social differences relating to beliefs on contraception. Interestingly, our data differs from national data on contraception usage, in which Hispanic men have lower utilization of contraception than both white and black men [9]. National

data also suggests that white women are more likely than blacks or Hispanics to use some form of contraception. In our cohort, the rate of contraception usage was very similar between black and Hispanic women (57.6% and 59%, respectively). While a recent study determined that access to contraception in the United States was relatively equal between ethnic groups, significant differences in counseling about options exist and may influence utilization rates [15]. While education may play a role in the national data, our study represents women and men of equal educational level, demonstrating the need for further outreach and studies to elucidate the factors behind differing contraception levels in these communities.

Our data indicate that students are more likely to use contraception if they are in a relationship than if they are single. However, students who were married were less likely to use contraception than those in nonmarital or partnered relationships. Although it was not assessed in our study, it is likely that a desire to initiate a pregnancy was driving some married subjects to avoid contraceptives.

Additionally, it is also likely that many of the married subjects were in monogamous relationships in which STD prophylaxis was not a particular concern. Unmarried individuals who were in a relationship were more likely to utilize some form of contraception relative to their married and single peers. This effect is likely related to increased sexual activity (relative to single students) with a concomitant desire to prevent unintended pregnancy.

In this study, students who were comfortable discussing sexual matters with patients were more likely to use effective contraception. This was consistent among all groups and likely represents a major factor influencing contraception practices among students. These findings are congruent with previous research [3] and provide evidence for the relationship between personal knowledge regarding sexuality and ability to communicate with patients about sexual issues. Given the importance of sexuality in personal health, it is imperative that medical professionals feel comfortable discussing sexuality with patients. Our findings demonstrate that, in addition to improved patient communication, comfort in discussing sexuality is associated with better informed contraceptive choices among providers.

Interestingly, students who felt that they had been well trained in sexuality during medical school were no more likely to utilize effective contraception. It cannot be denied that education during medical school is an important tool in acquiring contraception knowledge, and we believe that this finding is related to the way the question was phrased (i.e., with a greater emphasis on sexuality than on contraception). Furthermore, an individual's own contraception practice is likely set before medical school and may not be affected by training.

Despite a relatively high rate of contraception usage, a substantial minority of students in this study utilized contraceptive options with poor efficacy in the prevention of unintended pregnancies. The majority of male students in our sample were aged 25–29; this age group has been shown to be at high risk for failure to use contraception and/or use of ineffective modalities such as withdrawal [16]. Furthermore, there is a very clear difference in contraception utilization rates based on race and age. It cannot be gleaned from this data whether this effect is derived from a false sense of security or invulnerability regarding risk of pregnancy in this population or a lack of accurate information or personal beliefs regarding contraception. This interesting and concerning finding is worthy of further research and may have implications for medical educators when designing medical school curricula about contraceptive options.

These findings are of importance to health care providers who provide services to medical students, as well as to the larger population of college and post-graduate students. It is clear

that there are medical students in need of more counseling and education around contraception and safer sex practices; student health centers should collaborate with medical educators to ensure that students receive proper education and counseling regarding contraception and safer sex as well as access to effective contraception for personal use. The need for medical students to be well informed on matters pertaining to safer sex is particularly great, as these individuals may have profound influences on the public at large in the line of professional duties.

Several important limitations of this study must be addressed. This study represents a small proportion of North American medical students. Individuals with liberal views on sexuality and sex practice may be more likely to take and finish a sexuality survey and therefore our results may not be representative of the general medical student population. The regularity of contraceptive use was not quantified in this study. Furthermore, we did not directly explore the rationale for failure to use contraceptives. Some students may lack knowledge about effective contraception. Others may avoid contraception for religious or cultural reasons, or because they are attempting to initiate pregnancy. Individuals who participate in sexual activities other than coitus may have different needs for contraception, although the risk of STDs remains significant with noncoital sexual activity and safer sex practices should still be emphasized with these activities. It is for this reason that all students were included in the contraceptive analysis, which, as noted above, allows more comparison to known national demographic data which does not control for sexual minority groups.

Additionally, the National Survey of Family Growth data do not include any information on the contraceptive practices of Asian-Americans, which limits our capacity to compare our Asian medical student population to national norms for this major demographic group. Asian-Americans often have been neglected in large-scale analyses of contraception utilization [15,17]. Further investigations on racial predictors of contraceptive usage will be required to more clearly ascertain how representative our data are of the larger Asian-American population.

Despite these limitations, our findings suggest some important predictors of effective and ineffective contraception use; these data may be of value to medical school administrators and educators as well as to student health providers.

5. Conclusions

A small but significant minority of sexually active medical students do not utilize any form of contraception; other students utilize contraceptive methods of dubious efficacy, including over 10% who report using withdrawal. It is important that tomorrow's physicians be knowledgeable about effective contraception. Contraceptive knowledge benefits both the student (by prevention of unwanted pregnancy and STI) and their patients (by enhancing future doctor's ability to accurately counsel their patients on pregnancy prevention). Additional studies in this population are warranted. Assurance of quality contraceptive education and resources for medical students is mandated.

Acknowledgments

This study received financial support from the Sexual Medicine Society of North America (SMSNA). It was sanctioned by the American Medical Student Association.

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Table 1

Demographics

Variable	All students *		Male		Female	
	n	% of total	n	% of men	n	% of women
Race						
White	1540	69.7	623	70.1	913	69.5
Hispanic	145	6.6	63	7.1	82	6.3
Black	78	3.5	23	2.6	55	4.2
Asian	298	13.5	131	14.7	165	12.6
Other	148	6.7	49	5.1	98	7.5
Age						
<20	30	1.3	13	1.41	15	1.1
20-24	980	42.9	390	42.3	588	43.3
25-29	1033	45.2	401	43.5	629	46.3
30-34	174	7.6	83	9	91	6.7
>35	70	3.1	35	3.8	34	2.4
Relationship status						
Single	757	32.9	338	36.3	415	30.5
Any relationship	1546	67.1	594	63.7	948	69.6
Married	689	30	264	28	424	37
Medical partner	526	0.23	216	23	310	27
Sexual orientation						
Heterosexual	1983	87	772	84.3	1210	89.6
Homosexual	188	8.3	121	13.2	64	4.7
Bisexual	103	4.5	23	2.5	77	5.7
No. of sexual partners in past 6 months (if >0)						
1, 2	1636	83	614	77.8	1018	85.9
3 or more	179	9	112	14.4	66	5.6
Female sexual dysfunction (FSFI <26.55)					570	49
Comfort in discussing sex						
Present	1844	81	755	82.4	1082	80.3

Variable	All students*		Male		Female	
	n	% of total	n	% of men	n	% of women
Medical school sex education adequate	1060	46.7	446	48.8	612	45.4

* Numbers do not add up for gender as 10 students did not identify with a specific gender.

Table 2

Contraception/safer sex options utilized by medical students

	All students		Male		Female	
	Total	%	Total	%	Total	%
Condoms	1014	43.97	463	49.7	548	40.2
Oral female contraceptives	874	37.9	314	33.7	559	41
Contraceptive patches	29	1.3	9	1	20	1.5
Vaginal hormonal ring	156	6.7	39	4.2	117	8.6
Spermicides	26	1.1	12	1.3	14	1.1
Intrauterine device	87	3.8	18	1.9	69	5.1
Rhythm method	98	4.3	44	4.7	54	4
Withdrawal	249	10.8	97	10.4	150	11
Sterilization	27	1.2	11	1.2	16	1.2
Other [*]	12	<1	8	0.8	4	0.3
No contraceptive/barrier	607	26.3	274	29.4	327	24
Combined contraception						
OCPs and condoms	438	19	184	19.7	254	17.2
Condoms and withdrawal	160	6.9	91	10	67	4.9

^{*} Contraceptive implants, diaphragms, female condoms.

Table 3

Odds of using contraception: univariate and bivariate analysis

Variable	All students			Male			Female		
	%	OR	CI	%	OR	CI	%	OR	CI
Race									
White	78.2	reference		76.7	reference		79.3	reference	
Hispanic	81.4	1.2	.79–1.9	87.3	1.21	.79–1.9	76.8	0.89	.52–1.5
Black	60.3	0.42	.26–.68	56.2	0.42	.26–.68	63.6	0.46	.25–.81
Asian	59.1	0.4	.31–.52	50.4	0.4	.31–.52	66.7	0.51	.34–.72
Age									
<20	53.3	reference		46.2	reference		53.2	reference	
20–24	72.4	2.3	1.1–4.7	68.5	2.5	.83–7.7	75.2	2.6	.94–7.4
25–29	75.6	2.7	1.3–5.6	73.1	3.2	1–9.6	77.4	3	1.1–8.4
30–34	82.2	4	1.8–9.1	84.36	6.3	1.8–21.7	80.2	3.5	1.1–11.1
>35	68.6	1.9	.79–5.8	62.86	2	.54–7.2	76.5	2.8	.78–10.2
For each 5-year increase in age	NA	1.2	1–1.3	NA	1.21	.99–1.4	NA	1.19	.99–1.5
Relationship status									
Single	54.8	reference		56.5	reference		54.5	reference	
Any relationship	83.1	4	3.3–4.9	78.6	4.3	3.3–4.9	86	5.3	4.1–6.9
Married (vs. any relationship)	81	0.71	.54–.93	75	0.71	.54–.94	84.9	0.78	.54–1.4
Partner in medicine	87.6	1.6	1.2–2.2	89	1.62	1.2–2.2	85	1.43	.93–2.2
Sexual orientation									
Heterosexual	77	reference		75	reference		79.8	reference	
Homosexual	42.6	0.22	.16–.29	57	0.22	.16–.24	14.1	0.04	.02–.08
Bisexual	75	0.86	.55–1.3	61	0.86	.55–1.3	80.5	1	.58–1.9
No. of sexual partners in past 6 months (if 0 is reference)									
1, 2	88	6.3	4.4–8.7	85.3	6.2	4.4–8.7	90.1	6.8	4.4–10.7
3 or more	91	8.4	4.6–15	90.2	8.4	4.6–15.2	92.5	9.3	3.5–25.3
Female sexual dysfunction (FSFI <26.55)									
Clinical signs of depression	71.2	0.77	.63–.94	42	0.77	.63–.94	46	0.86	.66–1.1
Comfort in discussing sex	76	1.6	1.3–2	82.4	1.6	1.2–2	80.3	1.6	1.2–2.2
Medical school sex education adequate	74	1	.85–1.2	48.8	1.03	.64–1.2	45.3	1.2	.86–1.4

Table 4

Rate of any contraception use in North American populations

Characteristic	% of Men	% of Women
Married	61.1	72.9
White	84.5	64.6
Hispanic	0.74	39
Black	75	57.6
15–19	88.7	61.9
20–24	81.7	68.5
25–29	71.4	68
30–34	66.1	69.2
35–44	63	70

Source: Chandra et al. [13]; Martinez et al. [6].