
Accessing sexual health information online: use, motivations and consequences for youth with different sexual orientations

Kimberly J. Mitchell^{1*}, Michele L. Ybarra², Josephine D. Korchmaros² and Joseph G. Kosciw³

¹Crimes against Children Research Center, University of New Hampshire, Durham, NH 03824, USA, ²Center for Innovative Public Health Research, San Clemente, CA 92672-6745, USA and ³Gay, Lesbian & Straight Education Network, New York, NY 10004, USA

*Correspondence to: K. J. Mitchell. E-mail: kimberly.mitchell@unh.edu

Received on April 19, 2012; accepted on June 10, 2013

Abstract

We examine reasons why youth of different sexual orientations look for sexual health information online, and what, if anything, they do with it. The Teen Health and Technology study involved online surveys of 5542 Internet users, ages 13 through 18 in the United States. Searching for sexual health information online was reported frequently and varied significantly by sexual orientation: from 19% of heterosexual youth to 78% of gay/lesbian/queer youth. The most common reasons youth look for sexual health information is for privacy and curiosity. Sexual minority youth are more likely than heterosexual youth to report that they looked for information online because they did not have anyone to ask. Once youth have the information, no differences by sexual orientation were noted as to what they did with it. Instead, seeking out the information for privacy-related reasons and having no one to ask were related to taking some action on the information received. Findings indicate that online information is most valuable to those youth who lack alternatives. Care needs to be taken to help ensure that the sexual health information online is accurate and includes topics specific to sexual minority youth.

Introduction

The Internet provides ‘24/7’ access to information in an anonymous forum [1]. This may be why one in four (23%) youth Internet users have used the Internet to look for health information in the previous year [2]. Although depression, violence, and drug and alcohol problems are commonly searched for by youth [3], sexual health is especially mentioned as a critical topic of interest [4–8]. Forty-four percent of 15- to 24-year olds who have looked for health information online sought out information about sexual health, second only to information about diseases like cancer and diabetes [3]. This is perhaps unsurprising given the extensive sexual development that occurs in adolescence [9–11], and that youth often feel uncomfortable directly asking parents, teachers or other adults about topics such as pregnancy, sexuality, menstruation and sexually transmitted infections [12].

While adolescent online health information-seeking behavior has been researched previously [2, 6, 13, 14], there is a paucity of research about whether access to sexual health information positively affects healthy sexual behaviors (e.g. more condom use) in this population. There is reason for optimism that positive outcomes occur given that accessing *general* health information seems to be related to healthy behaviors. For example, accessing

health information online has been linked to behavior change. More than half (53%) of youth between the ages of 15 and 17 who have looked for health information online report that they have had a conversation with their caregiver about what they learned [3]. Furthermore, 41% of adolescents indicate having changed their behavior [15], and 14% have sought healthcare services [3] because of information they found online. Health information websites are, thus, potentially powerful influencers of health and behavior for many people; whether this extends to sexual health information sites has implications for sexual health promotion efforts.

A population-based study of adolescents, 13–18 years old has shown that about 5% of this population identifies as lesbian, gay or bisexual [16]. These sexual minority youth, defined here as lesbian, gay, bisexual, questioning and queer (LGBQ) youth, may be particularly likely to turn to the Internet for sexual health information because they lack access through traditional means: 69% of LGBQ youth report information relevant to their sexual orientation is not included in the sexual health curricula provided by their schools and 12% say it is discussed in a negative manner [17, 18]. Among a group of young men who have sex with men (MSM), hearing information about same-sex sexuality in their schools' sexual education classes was rare or non-existent [19]. Furthermore, LGBQ youth or youth who are questioning their sexual orientation may not be comfortable discussing sexuality with friends or family particularly if they have not disclosed their sexual orientation (i.e. 'are not out') to them [20, 21]. Thus, the privacy afforded by the Internet may make this mode of sexual information-seeking attractive.

Indeed, prior research indicates use of technology by the LGBQ population. Among a large survey of 18- to 24-year-old MSM in an HIV testing clinic, the majority reported using the Internet to find HIV/AIDS information [22]. Yet, although many LGBQ young people (ages 16–24) seek facts about sexually transmitted diseases and HIV online, few seek information about sexual health more generally [23]. Motivations for seeking out sexual health information online include

compensating for perceived limitations in offline resources and relationships [24]. So while it is normative for all youth to have questions about sexuality and health, LGBQ youth may have fewer offline resources to address these queries. Efforts to understand adolescent health information-seeking online cannot assume and therefore treat all youth as a homogenous group of information seekers.

Gaps still remain however. The limited information described above is based on either adult MSM or a small sample of 32 LGBT youth. We will use a large, nationally representative sample of LGBQ and non-LGBQ youth residing in the United States to first determine the extent to which youth seek sexual health information online and whether this information-seeking differs by sexual orientation. Next, we examine reasons why youth look for sexual health information. Finally, we explore what youth do with the sexual health information they find online.

Methods

Teen Health and Technology survey data were collected from August 2010 to January 2011 from five thousand nine hundred and seven 13- to 18-year olds in the United States. The survey protocol was reviewed and approved by the Chesapeake Institutional Review Board (IRB), the University of New Hampshire IRB, and the Gay, Lesbian and Straight Education Network (GLSEN) IRB. We received a waiver of parental consent to protect youth who would be potentially placed in harm's way if their sexual orientation was unintentionally disclosed to their caregivers.

Participants were recruited from two sources: (i) the Harris Poll Online (HPOL) opt-in panel ($n=3989$ respondents) and (ii) through referrals from GLSEN ($n=1918$ respondents). HPOL respondents were invited through password-protected email invitations to participate in a survey about their online experiences. The random sample was stratified to ensure equal representation of males and females, and older and younger youth. An

oversample of LGBQ teenagers was recruited through GLSEN’s referral efforts. Most GLSEN referral respondents were recruited through (i) emails sent with the survey link to their distribution list and (ii) publicizing the survey through targeted advertising on Facebook. Invitations to both groups referred to a study about ‘the Internet and health’.

The response rate for the HPOL sample was calculated as the number of individuals who start the survey divided by the number of email invitations sent less any email invitations that were returned as undeliverable. The survey response rate, 7.2%, is within range of other recent national Random Digit Dialing (RDD) telephone surveys [25, 26], even though these response rates typically appear higher than online response rates because it is impossible for online surveys to determine if the email has reached the intended recipient’s inbox (as opposed to being filtered out by spam filters), and individuals who have not ‘picked up’ their email. The response rate for the GLSEN sample cannot be calculated as the denominator is indeterminable.

Weighting procedures were used so that the data would behave as if they were nationally representative, and also to align the two samples so that they could be combined into one dataset. Propensity weighting is a well-established statistical technique that, when applied to data, minimizes the issue of non-randomness based on known covariates and establishes equivalency for those who are in the sample versus not due to self-selection bias [27–29]. HPOL data are consistently comparable to data that have been obtained from random telephone samples of the general populations once propensity weighting and appropriate sample weights are applied [27, 30–32]. (See [33] for more details about propensity score weighting in this study.)

The HPOL and GLSEN samples differed in some expected ways, even after taking into account weighting (see Table I). The HPOL sample was significantly more likely to be heterosexual (75% versus <1%), younger (45% were ages 13–15 compared with 39% of the GLSEN sample), White race (68% versus 63%), and live in a small town or rural area (40% versus 33%). GLSEN participants were

Table I. HPOL and GLSEN sample characteristics

Characteristic	HPOL sample (n = 3777) % (n)	GLSEN sample (n = 1765) % (n)	P value
Sexual orientation			
Heterosexual	75 (3375)	<1 (5)	<0.001
Bisexual	12 (112)	50 (543)	
Gay/lesbian/queer	8 (79)	48 (1203)	
Questioning/not sure/other	5 (211)	1 (14)	
Female gender	52 (2135)	61 (939)	<0.001
Age (years)			
13–15	45 (1640)	39 (553)	0.001
16–17	38 (1599)	39 (840)	
18	17 (538)	22 (372)	
Lower than average income	29 (892)	29 (433)	0.84
Hispanic ethnicity	19 (408)	23 (264)	0.03
White race	68 (2841)	63 (1235)	0.009
Type of community			
Urban or city area	28 (1048)	31 (591)	0.01
Suburban area	32 (1491)	36 (688)	
Small town or rural area	40 (1238)	33 (486)	
Parent with high school degree or less versus more	29 (754)	25 (352)	0.12

more likely to be of Hispanic ethnicity (23% versus 19%) and female gender (61% versus 52%). We see age differences in ways we would expect due to typical sexual development whereby one becomes increasing aware of one's sexual self, including sexual orientation, with age. The differences in ethnicity and race are not clinically significant but statistically significant due to our large sample size. The noted differences in type of community are expected given the stigma associated with being a sexual minority, particularly in smaller communities.

Procedure

The survey questionnaire was self-administered online. Qualified respondents were defined as (i) US residents, (ii) ages 13–18, (iii) in fifth grade or above and (iv) consented to participate in the survey. The median survey length was 23 min for HPOL respondents and 34 min for GLSEN respondents.

Measures

Sexual orientation was measured with the following question: 'Below is a list of terms that people often use to describe their sexuality or sexual orientation. How would you describe your sexuality or sexual orientation? Please select all that apply.' Response options included: gay, lesbian, bisexual, straight/heterosexual, questioning, queer, other or not sure. Youth were allowed to endorse multiple options. Mutually exclusive categories were created at the data cleaning stage so that analyses could compare youth across sexual orientation categories. Responses were categorized based upon the following hierarchy: gay/lesbian, bisexual, queer, questioning, and straight/heterosexual. Thus, as an example, if an individual identified as 'gay' and 'queer' they were categorized as 'gay/lesbian'; if an individual identified as 'bisexual' and 'questioning', they were categorized as 'bisexual'.

Had sample cell sizes permitted us to look at queer youth separately, we would have included them as a separate category. In that we could not, our choice was to either include the group with another category or delete these youth from the

sample. Based on recent research about identity labels among LGBTQ youth [34], we combined the queer youth with youth who self-identified with the historically traditional gay/lesbian identity. Among certain subpopulations of the LGBTQ community, queer is often more in line with lesbian/gay than with bisexual. Bisexual identity is more specific in that it connotes attraction to both genders whereas queer does not. We affirmed this decision by comparing behaviors of interest in the current paper among queer, gay, lesbian and bisexual youth; behaviors reported by queer youth were more consistently aligned with those reported by lesbian and gay youth. We conducted a similar analysis to determine how to include the youth who identified their sexual orientation as 'other'. Findings indicated that they were most similar to the questioning/unsure groups of youth. Thus, the final categories used in the current analyses were heterosexual, gay/lesbian/queer, bisexual and questioning/not sure/other.

Gender and sexual orientation are different. Thus, transgender youth may or may not be heterosexual. There was insufficient sample size to allow for categorization of transgender youth by sexual orientation.

Accessing health information was queried generally: 'In the past 12 months, how often have you searched online for health or medical information for yourself (not for other people you know)?' Next, specific health topics were queried: 'In the past 12 months, have you searched for any of the following topics online "for yourself"?: (i) sexuality or sexual attraction; (ii) how to have sex or sexual positions; (iii) HIV/AIDS or other sexually transmitted diseases; (iv) condoms or other types of birth control; (v) fitness or weight issues; (vi) drugs or alcohol; (vii) violence or abuse; (viii) medications or their side effects; (ix) depression, suicide, or anxiety; or (x) something else (specify).

Youth who had looked for information about sexuality or sexual attraction were asked additional follow-up questions about why they had looked for such information. The same follow-up questions were asked of youth who said they had looked for information about HIV/AIDS or other sexually transmitted diseases, as well as for youth who

looked for information about condoms or other types of birth control. For example, ‘Some people do not know about my sexual feelings or sexual orientation and they might find out if I asked them my question’. For analytic purposes, questions about why youth sought out sexual health information online were grouped into the following mutually exclusive categories: (i) no one to ask, or (ii) privacy-related (privacy, do not want people to know, embarrassed) versus (iii) curious/other (reference category). When youth indicated more than one of the above reasons for seeking out sexual health information online, priority was given to having no one to ask, followed by privacy-related reasons, and finally curiosity/other. Youth were also asked what they did with the information they received: for example, ‘Talked with a friend my age about what I found’. Questions about what youth did with the information they received were grouped into the following mutually exclusive categories: (i) had a conversation (talked with friend, online counselor, talked with parent), or (ii) took action (changing one’s behavior, visited doctor/clinic) versus (iii) did nothing/other (reference category). When youth indicated more than one of the above ways of handling the information they received, priority was given to taking action, followed by having a conversation, and finally doing nothing. Response options for both of the above sets of follow-up questions were based on previous surveys [3] and focus groups conducted to inform the current survey [35]. An ‘other’ open-ended response was included for situations where the options provided did not fit the specific respondent.

Demographic and Internet use characteristics

Age was coded as 13–15, 16–17 and 18 years old. *Gender* was measured by asking: ‘What is your gender? Your gender is how you feel inside’. Responses were dichotomized as female gender versus all other. *Income* was measured: ‘How would you describe your family’s income?’ Youth who indicated their income was ‘lower than average’ were compared with all other youth. *Region* was

measured by asking where the respondent’s school was located: in an urban or city area, in a suburban area next to a city, or in a small town or rural area. Youth also reported their *race* (coded as White, Black, Native American/Alaskan Native, all other), *ethnicity* (coded as Hispanic versus other) and their *caregiver’s highest educational attainment*. Based upon sample distribution, this variable was dichotomized at high school diploma or less versus at least some college or more.

Data analyses

Using STATA/SE 11.2 [36], data were imputed using multiple imputation. Respondents who gave valid answers (i.e. not ‘do not know’ answers) for less than 80% of the survey, or those who did not meet valid data requirements (i.e. survey length was less than 5 min; self-reported age at the beginning and end of the survey differed by more than a year) were dropped. The final sample size was 5542.

First, we used chi-square tests, corrected for survey weights (i.e. design-based F statistics), to test for statistically significant differences in bivariate comparisons of online health information search behavior by sexual orientation. Next, a multinomial logistic regression model was conducted to estimate the conditional odds of why youth sought out sexual health information online: (i) privacy-related reasons, or (ii) having no one to ask versus (iii) curious/other (reference category). Finally, a second multinomial logistic regression was conducted to estimate the conditional odds of doing something with the information found online given the specific reasons for searching for sexual health information: (i) had conversation, or (ii) took action versus (iii) doing nothing/something else (reference category). Both multinomial logistic regression models adjusted for sexual orientation, gender, age, income, ethnicity, race, type of community parent education and process variables: sample source (HPOL versus GLSEN), self-reported honesty in answering survey questions and completion of the online survey alone or with other people in the room.

Results

Accessing health information online

As shown in Table II, reports of accessing *any* health information online in the past year varied by sexual orientation from a low of 46% by heterosexual youth to a high of 81% by bisexual youth. Youth access to any *sexual* health information varied from a low of 19% by heterosexual youth to 40% by questioning/not sure/other, 65% by bisexual and 78% by gay/lesbian/queer youth. Accessing information about sexuality or sexual attraction was most frequently endorsed by gay/lesbian/queer youth (72%), followed by bisexual youth (54%). Information on HIV/AIDS or other sexually transmitted diseases was infrequently searched across all groups; that said: one in four (25%) gay/lesbian/queer youth reported this search in the past year. Accessing health

information about condoms or other types of birth control also was less common but most frequently reported by bisexual youth (32%).

Access to *non-sexual* health information was reported by at least half of youth of each sexual orientation: 51% of heterosexual, 58% questioning/not sure/other, 76% gay/lesbian/queer and 83% bisexual youth (Table II). Fitness and weight issues were the most common topics searched on, although rates significantly varied by sexual orientation. Mental health issues (i.e. depression, suicide or anxiety) were searched upon at rates highest for non-heterosexual youth. Topics about medications or their side effects, drugs or alcohol, and violence or abuse were searched upon at rates similar to each other. In all cases, however, bisexual youth and gay/lesbian/queer youth had higher access rates than youth of all other sexual orientations.

Table II. Percent of participants accessing health information online by sexual orientation ($N=5542$)

Health information accessed	Heterosexual youth ($n=3380$) %	Bisexual youth ($n=655$) %	Gay/lesbian/queer youth ($n=1282$) %	Questioning/not sure/other youth ($n=225$) %	Design-based F
Any health information	46	81	79	63	63.57***
Any sexual health information	19	65	78	40	154.69***
Types of sexual health information					
Condoms or other types of birth control	11	32	20	18	25.68***
Sexuality or sexual attraction	11	54	72	31	197.69***
HIV/AIDS or other sexually transmitted diseases	5	13	25	13	27.29***
Any non-sexual health information	51	83	76	58	49.29***
Types of non-sexual health information					
Fitness or weight issues	38	59	55	36	23.69***
Medications or their side-effects	17	30	29	15	19.13***
Depression, suicide, or anxiety	10	53	43	29	121.78***
Drugs or alcohol	8	27	21	9	43.35***
Violence or abuse	5	14	11	9	20.17***
Other	35	16	20	32	20.33***
Any sexual health information					
Why looked online ^a	($n=552$)	($n=494$)	($n=1026$)	($n=78$)	
No one to ask	10	24	27	16	6.50***
Privacy-related	43	44	46	62	
Curious/other	46	32	27	23	
What did with information ^a					
Took action	22	22	27	39	1.32
Had conversation	35	35	29	22	
Did nothing/other	42	43	44	39	

^aCategories are mutually exclusive. *** $P \leq 0.001$.

Why youth access sexual health information online and what they do with it

The most common reason for accessing sexual health information was for privacy-related reasons followed by curiosity (Table II). Significant differences by sexual orientation did exist however with heterosexual youth less likely than other youth to seek out sexual health information online because they had no one to ask (*design-based* $F=6.50$, $P<0.001$). Even after adjusting for other demographic characteristics, bisexual youth (adjusted conditional odds ratio: aCOR = 1.9, $P=0.02$), gay/lesbian/queer (aCOR = 2.1, $P=0.007$) and questioning youth (aCOR = 2.6, $P=0.007$) were around two times more likely than heterosexual

youth to seek sexual health information for privacy-related reasons in comparison to being curious (Table III). Seeking out such information because youth had no one to ask was significantly more commonly reported by all LGBQ youth compared with non-LGBQ youth. Age also was a noted factor in reasons for seeking out sexual health information: older teens (ages 16–17 and 18) were less likely than younger teens (ages 13–15) to seek out such information for privacy-related reasons or because they had no one to ask. Furthermore, youth in rural settings were significantly more likely to report they looked online because they had no one offline to ask, compared with simply being curious.

Almost half of all youth did nothing with the information they obtained (39–44% depending on

Table III. Conditional odds of why youth sought out sexual information online given sexual orientation

	All youth who accessed sexual information online ($n=2150$)			
	Privacy-related		No one to ask	
	aCOR (95% CI)	<i>P</i> value	aCOR (95% CI)	<i>P</i> value
<i>Sexual orientation</i>				
Heterosexual (ref)	1.0	—	1.0	—
Bisexual	1.9 (1.1–3.2)	0.02	3.0 (1.4–6.3)	0.004
Gay/lesbian/queer	2.1 (1.2–3.7)	0.007	4.1 (2.1–8.3)	<0.001
Questioning/not sure/other	2.6 (1.3–5.1)	0.007	2.3 (1.0–5.6)	0.05
<i>Other demographic characteristics</i>				
Female gender	0.8 (0.6–1.1)	0.25	0.9 (0.6–1.4)	0.81
<i>Age (years)</i>				
13–15 (ref)	1.0	—	1.0	—
16–17	0.6 (0.4–0.9)	0.01	0.5 (0.3–0.7)	0.001
18	0.5 (0.3–0.8)	0.005	0.4 (0.3–0.7)	0.002
Low income	1.2 (0.8–1.8)	0.28	1.3 (0.9–2.1)	0.20
Hispanic ethnicity	1.1 (0.7–1.8)	0.59	0.9 (0.5–1.6)	0.79
<i>Race</i>				
White (ref)	1.0	—	1.0	—
Black	1.3 (0.8–2.2)	0.34	1.2 (0.6–2.3)	0.65
Native American/Alaskan Native	0.5 (0.2–1.6)	0.25	0.9 (0.2–4.3)	0.89
All other	0.9 (0.6–1.5)	0.79	1.6 (0.9–2.6)	0.08
<i>Type of community</i>				
Urban or city area (ref)	1.0	—	1.0	—
Suburban area	0.8 (0.5–1.1)	0.22	1.1 (0.7–1.7)	0.69
Small town or rural area	1.1 (0.7–1.6)	0.73	1.7 (1.0–2.8)	0.04
Parent with high school degree or less versus more	0.8 (0.5–1.1)	0.19	0.7 (0.4–1.1)	0.15

Notes: Estimates in each category are conditional on those in the other outcome categories. ‘Curious’ is the reference category for each analysis. Categories are mutually exclusive. Estimates are adjusted for source of sample (HPOL versus GLSEN), honesty and being alone when taking survey. ref, reference category for each categorical variable.

Table IV. Conditional odds of doing something with the information found online given specific reasons for searching for sexual health information online

	All youth who accessed sexual information online (<i>n</i> = 2150)			
	Had conversation		Took action	
	aCOR (95% CI)	<i>P</i> value	aCOR (95% CI)	<i>P</i> value
<i>Sexual orientation</i>				
Heterosexual (ref)	1.0	—	1.0	—
Bisexual	0.8 (0.5–1.5)	0.53	0.8 (0.4–1.5)	0.52
Gay/lesbian/queer	0.8 (0.5–1.4)	0.46	1.0 (0.5–1.9)	0.98
Questioning/not sure/other	0.6 (0.3–1.4)	0.25	1.5 (0.6–3.9)	0.36
<i>Reasons for searching for sexual health information</i>				
Curious (ref)	1.0	—	1.0	—
Privacy-related	1.0 (0.7–1.4)	0.93	1.8 (1.1–2.8)	0.009
No one to ask	0.9 (0.6–1.4)	0.65	2.9 (1.7–4.9)	<0.001
<i>Other characteristics</i>				
Female gender	1.5 (1.0–2.1)	0.03	1.3 (0.8–1.9)	0.25
<i>Age (years)</i>				
13–15 (ref)	1.0	—	1.0	—
16–17	0.7 (0.5–1.0)	0.07	0.9 (0.5–1.3)	0.46
18	0.7 (0.4–1.1)	0.14	1.0 (0.6–1.7)	0.94
Low income	0.7 (0.5–1.1)	0.13	1.3 (0.9–2.0)	0.16
Hispanic ethnicity	0.7 (0.5–1.2)	0.21	0.7 (0.4–1.2)	0.22
<i>Race</i>				
White (ref)	1.0	—	1.0	—
Black	0.8 (0.5–1.4)	0.45	1.0 (0.5–2.0)	0.93
Native American/Alaskan Native	0.9 (0.3–3.0)	0.89	0.7 (0.2–2.2)	0.53
All other	0.9 (0.6–1.5)	0.80	1.1 (0.7–1.8)	0.70
<i>Type of community</i>				
Urban or city area (ref)	1.0	—	1.0	—
Suburban area	0.9 (0.6–1.3)	0.56	1.1 (0.7–1.8)	0.55
Small town or rural area	1.5 (1.0–2.3)	0.05	1.3 (0.8–2.0)	0.35
Parent with high school degree or less versus more	1.5 (1.0–2.2)	0.07	1.3 (0.8–2.2)	0.25

Notes: Estimates in each category are conditional on those in the other outcome categories. 'Did nothing with the information' is the reference category for each analysis. Categories are mutually exclusive. Estimates are adjusted for source of sample (HPOL versus GLSEN), honesty and being alone when taking survey. ref, reference category for each categorical variable.

sexual orientation); between 22–35% reported having a conversation with someone about it (e.g. a friend) and 22–39% took some action (Table II). No significant differences were noted by sexual orientation. Few differences in youth characteristics were noted based upon what youth did with the information, including sexual orientation (Table IV). Interestingly however, reasons for seeking out sexual health information online were significantly related to what youth did with it: seeking out information for privacy-related reasons (aCOR = 1.8, *P* = 0.009) or having no one to ask (aCOR = 2.9,

P < 0.001) was associated with increased odds of taking some action based on the information obtained (in reference to only curiosity).

Discussion

Among 13- to 18-year olds in the Teen Health and Technology study, searching for health information online was reported frequently: between 46% and 81% of youth, based upon sexual orientation, have used the Internet to find information about sexual and non-sexual health matters in the past year.

Contrary to expectations [4–8], non-sexual health topics were equally or more commonly reported by youth than those related to sexual health. Access to sexual health information seems to be particularly common and therefore salient, for LGBQ youth and less so for heterosexual and questioning youth. Indeed, the rates were almost twice as high for lesbian/gay/queer and bisexual youth, in part perhaps because these youth were more likely to say that they had no one to ask offline. This supports previous research that indicates LGBQ youth lack offline supports for and access to relevant health information [17, 18]. Certainly, more needs to be done to ensure that youth of all orientations are receiving relevant sexual health information as part of the school health class curriculum. Perhaps too, these data suggest that LGBQ-related healthy sexuality programming may be especially effective if delivered in an online versus in-person format.

Consistent with previous literature [3], one of the most important reasons youth look for sexual health information online is privacy; this is true for all youth, regardless of their sexual orientation. Youth often feel uncomfortable directly asking parents, teachers or other adults about sexuality-related topics [12] so the Internet may very well be seen as a source of information on such topics which are critical to adolescent development. Although our data suggest teens feel the Internet is a private location for seeking information on sensitive topics, other research has noted a number of reasons for *not* using online sexual health information among sexual minority young people, including the stigma associated with being observed accessing LGBQ or HIV information online [23]. Perhaps the Internet is perceived as a more private source of information, but only in situations when online searches can be done in private. More opportunities for private online searches are being introduced with the popularity of Smart phones with teens [37, 38], thereby not limiting their Internet access to computers in the home, school or library.

Most commonly, adolescents said that they did nothing with the sexual health information they found online. This lack of use of the information is

perhaps explained by the fact that about one-third of youth look for sexual health information because they are curious, not because they have a particular or actionable concern. Nonetheless, between 22% and 39% of sexual health information seekers took some action based on the information they received, i.e. changed their behavior in some way or sought medical care. Having a conversation about the information was reported by 22–35% of youth, demonstrating the powerful influence that peers have on each other's sexual health decision making. Peers may be particularly safe and important in helping adolescents process what they are learning and the opinions that they are forming in some situations. Differences in use of the sexual health information received were not noted by sexual orientation so it is youth access to sexual health information, not use that differentiates these groups.

Specific reasons for using the Internet as a tool for sexual health information seeking are related to increased likelihood of taking some action. In comparison to curiosity, seeking out sexual health information for privacy-related reasons or having no one else to ask were each associated with an increased likelihood for taking some action. This was true of all youth, regardless of sexual orientation. Thus, for all youth, the Internet is an important resource for young people who do not feel that they have safe offline connections to sexual health information. Indeed, findings indicate that online information is most valuable to those youth who lack alternatives. Ensuring that accurate websites are available for these youth when and where they are looking online is critical for healthy sexual development. It also seems like an important opportunity for which public health professionals to take advantage. Informational websites could be seen as portals whereby curious youth are able to simply search and satisfy their questions, and those interested in more intensive behavior change support could be funneled to tailored intervention websites. More details about these youth and strategies that are most effective at taking advantage of this teachable moment will be instrumental for promoting more behavior change among teens.

Limitations

Although this study has a number of strengths, including being among the largest samples that include both LGBQ and non-LGBQ youth, there are some limitations that must be noted. First, we have no information about the quality and accuracy of the sexual health information youth received. Second, we do not know whether sexual health information was accessed prior to or after engaging in sexual behavior. Third, we do not have any information about whether youth are also accessing sexual health information offline for comparison. Fourth, we do not have detailed information about the type of action youth took with the sexual health information they received. Finally, differential recruitment of the HPOL and GLSEN samples could have introduced some bias in the responses of participating youth. We adjust for this, however, through propensity score weighting and adjusting for sample source in our multivariate analyses.

Conclusion

Findings from this study support the hypothesis that sexual minority youth are, in fact, more likely to seek out information about sexual health online in comparison to heterosexual youth. They do so for a multitude of reasons including curiosity, privacy and having no one to ask. All of these reasons are applicable to youth in general but seem to be particularly relevant to sexual minority youth. Care needs to be taken to help ensure that the sexual health information youth receive online is accurate and includes topics specific to sexual minority youth. Such information should be easily accessible and include a variety of resources where sexual minority youth can seek out help, anonymously and/or privately, if desired.

Acknowledgements

We would like to thank the entire Study team from the Center for Innovative Public Health Research, the University of New Hampshire, the Gay Lesbian Straight Education Network (GLSEN), Latrobe University, and Harris Interactive, who contributed

to the planning and implementation of the study. We thank the study participants for their time and willingness to participate in this study.

Funding

This work was supported by a grant from the National Institute of Child Health and Human Development [Grant No. R01 HD057191]. The content is solely the responsibility of the authors and does not necessarily represent the official views of the Eunice Kennedy Shriver National Institute of Child Health & Human Development or the National Institutes of Health.

Conflict of interest statement

None declared.

References

1. Fox S *et al.* *The Online Healthcare Revolution: How the Web Helps Americans Take Better Care of Themselves*. Washington, DC: Pew Internet & American Life Project, 2000.
2. Ybarra M, Suman M. Reasons, assessments, and actions taken: sex and age differences in uses of Internet health information. *Health Educ Res* 2008; **23**: 512–21.
3. Rideout VJ. *Generation Rx.com: How Young People Use the Internet for Health Information*. Washington, DC: The Henry J. Kaiser Family Foundation, 2001.
4. Buhi ER *et al.* An observational study of how young people search for online sexual health information. *J Am Coll Health* 2009; **58**: 101–11.
5. Baxter L, Egbert N, Ho E. Everyday health communication experiences of college students. *J Am Coll Health* 2008; **56**: 427–36.
6. Borzekowski DL, Rickert VI. Adolescent cybersurfing for health information: a new resource that crosses barriers. *Arch Pediatr Adolesc Med* 2001; **155**: 813–7.
7. Borzekowski DLG, Rickert VI. *Adolescents, the internet, and health: Issues of access and content*. In: Calvert SL, Jordan AB, Cocking RR (eds). *Children in the Digital Age: Influences of Electronic Media on Development*. Westport, CT: Praeger Publishers/Greenwood Publishing Group, 2002, 71–82.
8. Escoffery C *et al.* Internet use for health information among college students. *J Am Coll Health* 2005; **53**: 183–8.
9. Lerner RM, Galambos NL. Adolescent development: challenges and opportunities for research, programs, and policies. *Annu Rev Psychol* 1998; **49**: 413–46.

10. Steinberg L, Morris AS. Adolescent development. *Annu Rev Psychol* 2001; **52**: 83–110.
11. Petersen AC. Adolescent development. *Annu Rev Psychol* 1988; **39**: 583–607.
12. Gray NJ *et al.* Adolescent girls' use of the Internet for health information: issues beyond access. *J Med Syst* 2002; **26**: 545–53.
13. Ybarra ML, Suman M. Help seeking behavior and the Internet: a national survey. *Int J Med Inform* 2006; **75**: 29–41.
14. Gray NJ *et al.* Health information-seeking behaviour in adolescence: the place of the Internet. *Soc Sci Med* 2005; **60**: 1467–78.
15. Kaiser Family Foundation. *Key facts: Teens Online*. Washington, DC: The Henry J. Kaiser Family Foundation, 2002.
16. Harris Interactive, GLSEN. *From Teasing to Torment: School Climate in America, A Survey of Students and Teachers*. 2005. Available at: <http://www.glsenboston.org/GLSENFromTeasingToTorment.pdf>. Accessed: 2 July 2013.
17. Kosciw J, Diaz EM. *The 2005 National School Climate Survey: The Experiences of Lesbian, Gay, Bi-sexual, and Transgendered Youth in Our Nation's Schools*. New York: GLSEN, 2006.
18. Kosciw JG *et al.* *The 2011 National School Climate Survey*. New York: GLSEN, 2012.
19. Kubicek K *et al.* In the dark: Young men's stories of sexual initiation in the absence of relevant sexual health information. *Health Educ Behav* 2010; **37**: 243–63.
20. Friedman CK, Morgan EM. Comparing sexual-minority and heterosexual young women's friends and parents as sources of support for sexual issues. *J Youth Adolesc* 2009; **38**: 920–36.
21. Doty ND *et al.* Sexuality related social support among lesbian, gay, and bisexual youth. *J Youth Adolesc* 2010; **39**: 1134–47.
22. Mustanski B, Lyons T, Garcia SC. Internet use and sexual health of young men who have sex with men: a mixed-methods study. *Arch Sex Behav* 2011; **40**: 289–300.
23. Magee JC *et al.* Sexual health information seeking online: a mixed-methods study among lesbian, gay, bisexual, and transgender young people. *Health Educ Behav* 2012; **39**: 276–89.
24. DeHaan S *et al.* The interplay between online and offline explorations of identity, relationships, and sex: a mixed-methods study with LGBT youth. *J Sex Res* 2012; **50**: 421–34.
25. Lenhart A *et al.* *Social Media & Mobile Internet Use Among Teens and Young Adults*. 2010. Available at: http://www.pewinternet.org/~media/Files/Reports/2010/PIP_Social_Media_and_Young_Adults_Report.pdf. Accessed: 8 June 2010.
26. Mitchell KJ, Jones LM, Wolak J. *The Youth Internet Safety Survey (YISS) Methodology Report*. 2011. Available at: http://unh.edu/ccrc/pdf/YISS_Methods_Report_final.pdf. Accessed: 2 July 2013.
27. Schonlau M *et al.* A comparison between response from a propensity-weighted Web survey and an identical RDD survey. *Soc Sci Comput Rev* 2004; **22**: 128–38.
28. Rosenbaum PR, Rubin DB. Reducing bias in observational studies using subclassification on the propensity score. *J Am Stat Assoc* 1984; **79**: 516–24.
29. Terhanian G, Bremer J. *Confronting the Selection-Bias and Learning Effects Problems Associated with Internet Research*. New York, NY: Harris Interactive, 2000.
30. Berrens RP *et al.* The advent of Internet surveys for political research: a comparison of telephone and Internet samples. *Polit Anal* 2003; **11**: 1–22.
31. Terhanian G *et al.* The record of Internet-based opinion polls in predicting the results of 72 races in the November 2000 US elections. *Int J Mark Res* 2001; **43**: 127–38.
32. Berrens RP *et al.* Information and effort in contingent valuation surveys: application to global climate change using national internet samples. *J Environ Econ Manage* 2004; **47**: 331–63.
33. Ybarra ML *et al.* Associations between bullying and suicidal ideation in a national sample of lesbian, gay, bisexual, questioning, and heterosexual adolescents (under review).
34. Russell, ST, Thomas JC, Justin C. Are teens “post-gay”? Contemporary adolescents' sexual identity labels. *Journal of Youth and Adolescence* 2009; **38**: 884–90.
35. Hillier L, Mitchell KJ, Ybarra ML. The Internet as a safety net: findings from a series of online focus groups with LGB and non-LGB young people in the United States. *J LGBT Youth* 2012; **9**: 225–46.
36. StataCorp. *Stata Statistical Software*. College Station, TX: Stata Corporation, 2009.
37. Lenhart A. *Teens and Mobile Phones Over the Past Five Years: Pew Internet Looks Back*. Washington, DC: Pew Internet and American Life Project, 2009.
38. Lenhart A *Teens, Smartphones & Texting*. 2012. Pew Internet & American Life Project, Available at: http://www.pewinternet.org/~media/Files/Reports/2012/PIP_Teens_Smartphones_and_Texting.pdf. Accessed: 20 April 2012.