AMERICAN JOURNAL OF SEXUALITY EDUCATION
2018, VOL. 13, NO. 4, 487 503
https://doi.org/10.1080/15546128.2018.1505572

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Late Adolescent User Experiences with Online Sexual Health Resources: A Qualitative Study

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ABSTRACT

Adolescents rely on the internet as a primary source for sexual health information. Understanding users' assessments of trust and credibility in online materials may help inform interventions. Cognitive interviews with web observations were conducted with late adolescent internet users ($n = 30$). Web activity was tracked and transcripts analyzed using modified grounded theory. Sexual health information is found online without attempts to locate specific websites. Personal stories are preferred for learning about sexual identity. Teen-friendly-styled sites were avoided. Information found online was validated with sexuality education and life experiences. Practitioners and educators should prioritize developing online cues that communicate credibility to adolescents.

KEYWORDS

Sexual health; internet; adolescent health; sexuality education; online trust

Introduction

Adolescents rely heavily on the internet as a source of health information. More than 93% of adolescents report using the internet daily for on-demand information about topics important to them (Boyar, Levine, & Zensius, 2011; Guse et al., 2012). Internet users in late adolescence or emerging adults (ages 18–24) are in a critical developmental stage for a healthy transition into adulthood (Arnett, 2000; Steinberg, 2014). Late adolescents become more sexually active with higher numbers of partners, putting them at higher risk for negative sexual health outcomes (Kan, Cheng, Landale, & McHale, 2010).

The web has great potential to meet sexual health information needs unique to this population, including the ability to confidentially view information about sexually transmitted infections (STIs) without the stigma that sometimes accompanies face-to-face conversations about negative sexual

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health outcomes (Boyar et al., 2011). Adolescents steadily increase their reliance on the internet into young adulthood to find information about pressing, personal health problems (Ybarra & Suman, 2008), and as they approach adulthood, emerging adults report that they feel most comfortable accessing sexual health information on websites, even more than with a doctor (Lim, Vella, Sacks-Davis, & Hellard, 2014).

Given that adolescents use the internet often as a first destination for sexual health informational needs (Crutzen, Roosjen, & Poelman, 2013), public health practitioners have created sexuality education websites as a way to intervene to improve sexual health outcomes. The promise of sexuality education websites is to improve knowledge and self-efficacy for sexual health and well-being at an individual level (Nunn et al., 2017) on a platform that is near universal. Today there are few differences in internet access and usage based on race, ethnicity, or gender, making sexual health and sexuality education websites a type of intervention with tremendous potential to reach broad numbers of young web users across different sociodemographic groups (Hargittai, Fullerton, Menchen-Trevino, & Thomas, 2010; Pascoe, 2011). Yet while education websites generally contain current and accurate information (Jones & Biddlecom, 2011), a recent content analysis of 14 popular sexuality education websites by Marques et al. (2015) showed that they typically overemphasize STI prevention and management and pregnancy issues, and include little discussion of nonmedical topics like gender, sexual rights, or sexual diversity. Additionally, sexuality education websites exhibit variability in content, design, configuration, and usability, all of which impact the user experience (Whiteley, Mello, Hunt, & Brown, 2012). Isaacson (2006) notes that creators of education websites build these interventions with the assumption that young people will find them on the web, but this has not been confirmed.

Sexuality education websites are only a fraction of sites late adolescents may be exposed to when they go online. Users seeking sexual health information on the web risk encounters with inaccurate, irrelevant, or misleading information, including pornography (Fiksdal et al., 2014). Risks may be compounded if searching the web is motivated by an imminent sexual health concern intended to guide a health decision or behavior (Levine, 2011).

It is important to understand the adolescent process of searching the web for finding sexual health information so that we can more accurately gauge how visible online interventions are to young people. It is also important to understand what online resources this age group trusts and finds credible in this subset of online health information. Trust is a salient concept for online resources of all forms (Briggs, Sillence, Harris, & Fishwick, 2007; Cheshire, 2011). Trust includes aspects of interpreting and

internalizing information, and is linked to behavioral intentions for health decision making (Gray, Klein, Cantrill, & Noyce, 2002; Selkie, Benson, & Moreno, 2011). Positive and trusting experiences with online sexual health information may play a part in behavioral intentions related to decision making (Noar, Clark, Cole, & Lustria, 2006). Yet, while previous studies have investigated trust and credibility assessments for online information, little is known about how late adolescents approach the web for sexual health information specifically (Horgan & Sweeney, 2012). Understanding adolescent user process can help inform the design and placement of sexuality education websites in the online environment to increase visibility of high quality, credible resources.

This qualitative study addresses visibility and perceived trustworthiness of online sexual health information by examining the behaviors and experiences of late adolescents as they attempt to seek and use online sexual health resources. Our methods place late adolescents in a controlled yet ecologically valid context for investigating how users search and evaluate online sexual health information. Our goal is to enhance our understanding of processes for finding and consulting sexual health resources in this key age group, and uncover specific perceptions and beliefs related to trust and credibility for online sexual health information.

Methods

Recruitment and sample

Individuals between 18 and 20 years of age were purposively sampled at a large, public university in the United States. In partnership with an on-campus social science experiment laboratory (X-Lab), we recruited participants via an online announcement to X-Lab email subscribers. In order to ensure a diverse sample with broad representation of race and gender, we supplemented our purposive age sampling with snowball sampling to reach a higher number of under-represented minorities (URMs) and to recruit an equal number of men and women. No one was excluded based on prior experiences with online sexual health information.

In-depth interviews with web observations

The first author (SS) conducted in-depth interviews to assess participants' experiences while seeking and evaluating online sexual health and sexuality information. To maximize participant comfort, interviews took place in a quiet room with only the interviewer and participant at a private lab computer station. Our procedure consisted of three guided activities on a standard PC with a web browser. During all activities, the interviewer

instructed participants to think aloud and verbalize their thought process. Think aloud protocols help elicit underlying judgments when coupled with observable behaviors (Earle, 2004; Ericsson, n.d.; Rieh, 2002).

First, participants were instructed to conduct a brief warm-up activity to get familiar with the think aloud protocol, their computers, and the interviewer. Next, participants were instructed to perform uninterrupted search tasks in response to four search prompts about sexual health topics: (a) safer sex; (b) sexual risks, including STIs; (c) sexual responsibility; and (d) sexual identity. For example, when prompted about sexual responsibility, participants were asked to imagine that they were in a new romantic relationship and wanted to go online to find information about how to be sexually responsible. These four sexual health topic prompts were selected to allow participants to assess and discuss a range of sexual health information, rather than only negative aspects of sexual health (e.g., unwanted pregnancy or disease contraction), and is more consistent with a comprehensive sexual health framework developed by sexuality educators (National Guidelines Task Force, 2004). Prompts about sexual identity and risk were phrased in a hypothetical context to reduce respondent discomfort. Scenario-based prompts allow participants to be engaged in a more conceptual, less personal way, appropriate for questions about sexual activity or sexual health, and aid in eliciting honest responses (Bernard, 2011). After receiving prompts, the interviewer activated web recording and instructed participants to guide the conversation freely while searching the web. Interviews consisted of thoughtfully probing participants' verbalized thoughts while also observing participants' online behavior (Liao & Fu, 2014).

Third, after search tasks were complete the interviewer played back the participant's own web movements, with the participant watching, as screen-captured videos from their prior search activities (including typing, mouse trajectory, and clicks). This final step combined real-time "think aloud" discussions (in situ) with reflective evaluations of prior search and selection activities, allowing for deep reflection on how they judged, selected, and avoided specific web resources. Finally, participants were asked to complete an optional brief survey that captured participant age, gender, and ethnicity. Participants were also asked to rate their reliance on the internet for sexual health informational needs (use internet regularly for this purpose, sometimes for this purpose, or usually consult other sources), and if they had ever visited a health provider for a sexual health issue (yes/no). Together, all parts of the interview did not exceed 90 minutes.

Data was collected from December 2014 to February 2015. Audio was captured with a digital voice recorder; online search activities, web navigations and browser histories were captured using CamStudio. Users were

paid $20/hour for their participation, and completed a brief questionnaire to conclude the session. Computers were connected to the internet with a reliable private wired network. No user preferences were saved and search histories were deleted after each interview.

Coding and analysis

Transcripts of verbal data and video files of web navigations were analyzed using a modified grounded theory approach, including two a priori constructs from relevant literature, online trust, and web credibility. In addition to these two core themes, we identified and coded emergent themes in an inductive, iterative fashion consistent with grounded theory (Miles, Huberman, & Saldaña, 2013). MaxQDA (v. 11.2.2) was used for all coding and analysis.

The first author and two trained research assistants iteratively reviewed data and identified a priori themes (online trust and web credibility) and emergent themes. The team then coded transcripts in MaxQDA using a preliminary code list, which was refined through an iterative process. Coded segments and the code list were iteratively refined for all transcripts through discussion among team members. To address reliability, all discrepancies in interpretations of codes were discussed and resolved between the three coders via consensus to reach full agreement for the final codebook. All audio transcriptions were then coded by the two research assistants according to the codebook. Finally, the first and second author then coded the video files using the final codebook.

We collated and analyzed browser histories separately in Excel. Numbers and domain names of unique web pages visited by each participant were tallied. We assigned codes to denote, which prompt participants were responding to when visiting each web page. Search terms and search strings were extracted for keyword analysis. We also assigned codes to each search string to indicate whether it was used with the intention of finding a specific, targeted web resource. Targeted search strings were coded as such if they included a known resource, author, or entity along with other descriptive search terms.

The study was approved by the University of California, Berkeley institutional review board.

Results

Fifteen men and 15 women (n 30) completed web observation interviews. Participants were 33% Latino/a (n 10); 30% Asian Pacific-Islander (n 9); 23% White (n 7); and 13% African American (n 4). Mean age

Table 1. Sample Characteristics ($n = 30$).

Characteristic	Percentage or mean
Gender	Women (50%) *n* 15
	Men (50%) *n* 15
Ethnicity	Latino/a (33%) *n* 10
	Asian Pacific Islander (30%) *n* 9
	White (23%) *n* 7
	African American (13%) *n* 4
Age	Average age, 18.9 years
	Age 18 *n* 9
	Age 19 *n* 15
	Age 20 *n* 6
Reliance on internet for sexual health informational needs	Use internet regularly for this purpose (50%) *n* 15
	Sometimes uses internet (40%) *n* 12
	Usually consult other sources (10%) *n* 3
Ever visited health provider for sexual health issue	Yes (30%) *n* 9
	No (70%) *n* 21

is 18.9 years. See Table 1 for full demographic results. Twenty-six video recordings of participants' search processes and web navigations were captured, as well as 28 corresponding interview transcripts and 30 browser histories. Four participants declined to have web activity recorded; two declined to be audio recorded.

Seven themes were identified and correspond to four identified stages of participant process for finding sexual health information online. Phases are introduced and themes discussed below. We also present findings of the visibility of sexuality education websites in participants' experience of searching the open web (see Table 2 and Figure 1).

Initial approach

When given prompts, participants first considered how to conduct a search strategy, what search engine to use, and whether the web would likely meet their informational needs. Before beginning their navigation, one quarter of participants expressed that the internet is not the best place to seek sexual health information, either because they prefer to consult another source first or because the internet would not be useful in certain circumstances. One 19-year-old (yo) female participant explains that for trying to find information about sexual identity, "I feel like I wouldn't know what to Google search in this situation, like how to know if I am gay . . . " Trusted peers or a health care provider were often named as the most appropriate personal resource to get offline information for all types of sexual health information. Some users also noted they would discuss this issue with a trusted peer over an online social media network, like Facebook, rather than searching the web.

Theme 1. Untargeted web searching

The majority of users began searches by conducting untargeted search strategies: opening preferred search engines (e.g., Google, Yahoo!, Bing)

Table 2. Study Findings.

Four phases of interaction with the internet for sexual health information, late adolescent users	Seven corresponding key themes in phases
Approach *Adolescents consider whether the internet is the best starting place for sexual health informational needs, whether to consult a search engine or social media*	(1) Untargeted web searching (2) Gender differences for finding information about sexual responsibility (3) Targeted searching for sexual identity
Selection *Adolescents make selection choices from search results lists for websites to evaluate*	(4) Reliance on top search results (5) Storytelling preferred for resources about sexual identity
Assessment *Adolescents make judgments and evaluations of resources selected, including what to read carefully and what to avoid*	(6) Aversion to teen friendly styled resources
Corroboration *Adolescents check information with other online resources, and reference online information to offline and personal experiences*	(7) Online sexual health information checked for consistency in other contexts

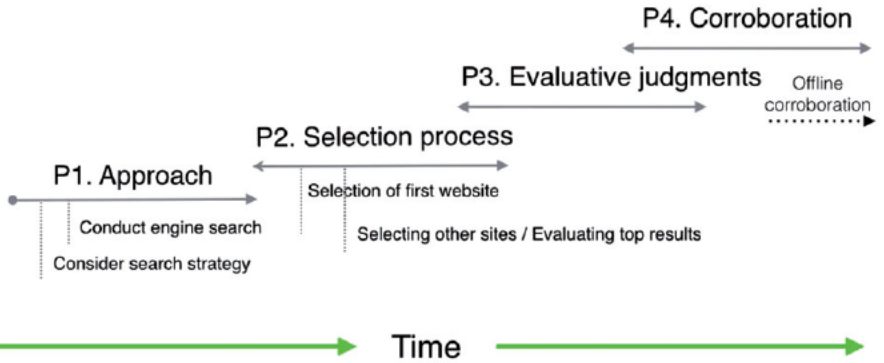

Figure 1. Late adolescents' phases of interaction with the web with sexual health resources over time.

and typing in descriptive keyword search terms (i.e., "deciding to have sex") without a specific intended online destination. In less than 10% of instances, users searched by typing in a specific web address instead of using a keyword search strategy. Participants verbalized that their choice for untargeted search strategies was sometimes due to uncertainty about how to begin their search. An 18yo female participant comments, "I guess I wouldn't really know where to start besides Googling 'sexual health' . . . " Strong preferences for using Google to start queries are consistent with known user preferences for Google in young adults (Bing et al., 2007). A 19yo female participant compared Google to other engines stating, "[Google]'s so much easier. So much cleaner. I think about Yahoo and Bing, it's just not appealing to the eye, or at least to my eyes."

Users sometimes deviated from using an untargeted search strategy when they wanted to consult a website they had already visited or knew about. In these instances, participants did a targeted search strategy, which we

Table 3. Illustrative Keyword Search Terms for Finding Information About Sexual Responsibility.

Search queries	Male participants	Female participants
	Ways to make woman feel secure	Types contraception
	Ways to know if girlfriend wants to have sex with you	Consent romantic sexual
	How know to go next level with partner	Contraception option
	How to have safe sex	Losing your virginity
	Talk to girlfriend sex	How do I feel after losing virginity
	Things to prepare before sex	New forms protection for sex
	Would girls want guys put on condom during sex	Why do guys like a girl

define as typing in descriptive keyword search terms together with the name of a particular website, organization, author, or online personality. For example, one participant searched with the term "coming out youtube lacy" to find online educator Laci Green during the sexual identity prompt.

Targeted searching was done most often to find information about sexual identity (39% of targeted searches). In addition, 34% of targeted searches were to find websites run by health groups that offer "brick and mortar" health and wellness or clinic services or settings. The most common brick and mortar clinical entity participants searched for was Planned Parenthood: five out of 30 users included "planned parenthood" in their search terms to find this resource at the top of their results lists.

Theme 2. Differences by gender when searching for information about sexual responsibility

Search terms used for interviewer prompts on safer sex and sexual harms were consistent between women and men. For learning about safer sex and condom use, participants of both genders preferred to go to YouTube first to find condom video tutorials. Differences were observed by gender in how the sexual responsibility prompt was interpreted; distinctly different keyword search terms were used. Women more often directed their searches towards information about contraception, STI prevention, and negotiating safety in sexual situations. Men more often wanted to find information about sexual communication, relationship advice, and navigating new sexual situations in the context of advancing intimacy (see Table 3).

Theme 3. Searching about sexual identity topics includes finding personal stories

When finding information on other topics than identity, adolescents often began search strings with "how to" (i.e., "how to put on a condom," "how to avoid STD," "how to have safe sex"). This approach consistently yielded more medically-oriented sites in search result lists, such as WebMD.com. In approaching the sexual identity prompt, almost a quarter (24%) of search terms used by participants related to identity through a first person or

narrative lens ("am I gay," "I think my friend is gay," "coming out issues for latina," "queer stories") and less on a didactic instructional format. Six participants entered terms to find stories about nonidentity related topics, such as coping with or preventing STIs, but the majority of users sought to find personal stories about knowing or questioning one's own sexual identity.

Selecting online resources

After searching the web for sexual health information using either a targeted or untargeted approach, participants then reviewed search result lists for what they considered to be credible resources and resources they recognized. 1,429 total web pages were visited across the sample.

Theme 4. Reliance on top search results

Resources that appeared at the top of search results lists were consistently selected and opened for all searches. Users defined "top" results as those at the top of search results lists, including links inside preview boxes, but did not consider paid suggested links or link ads on the sides of the web page to be part of top results. Very rarely did any adolescent user consult search results on second or third pages of results lists. When probed about why they did not visit second or third pages of search results, participants reported that resources near the top of search results lists were more likely to contain the most relevant, highest quality, and most accurate information.

> I think the first page of Google just seems more, has more of the stuff I'm looking for, like related to what I've been searching. I just know that if I can't find it on the first page, I'm not going to find it on the second page. (18yo female)

As an 18yo male participant chooses a website to open, he says: "Like this one, maybe, but this one has a lot of views. So, I trust that it's at least valid and it was also the top result which helps."

Five out of 30 users directly expressed they knew that companies and sponsoring organizations could pay for top search results placement (" . . . companies pay big money so they are first in the search engine . . . "), but this did not seem to detract from the habit of trusting and consulting top search results. Paid placements in main results lists (not sidebar advertisements) were thought among some users to confirm the legitimacy of top resources: "So, if they are paying for the spot, then you feel like then they probably are going to have some good information." (19yo female)

Theme 5. Storytelling preferred for learning about sexual identity online

Participants preferred narrative, storied accounts related to sexual identity. To find web resources about sexual identity, participants used storied

(more personal first-hand accounts and stories) search terms, yielding more personally produced web pages. For selecting resources, participants then also selected links to blogs, forums, individual Tumblr and other social media pages, documentary links, and other online content published in the first-person narrative. Web pages that appeared to be socially conservative or focused on religion or news, including sites detailing social controversies around sexuality issues, were generally avoided for all prompts, but especially when selecting resources about sexual identity.

Assessing credibility of selected websites

Participants preferred clean, accessible layouts and sites with minimal advertisements, pop-ups, and unrelated images. Participants stayed on a page and navigated within sites if they expressed a verbal preference for its visual presentation. Bulleted and expandable drop-down or collapsible styles of presenting information as well as photos were preferred for being able to skim and access information quickly. Content on sites styled with full paragraphs or blocks of text were generally avoided.

Theme 6. Aversion to "teen-friendly" styled resources

Layouts perceived as overly "teen-friendly," as expressed by use of contrasting colors, visual volume, and an "MTV" quality, were thought to be outdated ("they were designed in the 90s") and less reliable for in-depth information about topics. Respondents verbalized an aversion to the teen-friendly style of some sexuality education websites they encountered.

Participants consistently expressed the need as a last step to find and corroborate information across other resources. Users consistently said this was important even if a particular web resource contained what the user thought to be complete or satisfying information for the prompt.

Corroborating sexual health information

Participants demonstrated and verbalized that confirming or corroborating what they examined online was an important step for reaching a "satiated" point for learning about sexual health. Users corroborated information in one or more ways: with other online resources, with offline resources, or through personal experiences.

> I mean let me try another [site]. I just want to see which one gives more information or if all the pages say the same thing. So I want to look for consistency in my answers I guess. I mean if I look at some page and it says like totally something different I'm like, that's one I might avoid. (19yo female)

The act of online corroboration––opening new tabs, conducting new untargeted search strategies, toggling between open web pages to compare information––was observed during the search process for all participants. The most common strategy for corroborating found information elsewhere online was to conduct a second parallel untargeted search using the same search engine, and click into one to four websites found on the first page of search results to verify information, or opening hyperlinks on a current page to view substrate website content.

Theme 7. Online information checked for consistency in offline contexts

When corroborating online resources with offline information and lived experiences, four participants did so by noting whether what they read online was consistent with what they learned in classroom-based sexuality education. One participant recognizes online information from the same group that gave a sexuality education seminar at his high school:

> In our health class we were to like fill out their worksheets and stuff, and so since the school recommended it, I thought it should be useful. (18yo male)

Four additional users also noted when information was verifiable from experiences with health care providers or in clinical settings. One 19yo male participant explains how he looks for STI treatment information online from his doctor's website, and compares information from a prior conversation with his doctor:

> Yeah like looking for how I am going to be treated and not have this happen again, like just what to expect, because I am going to be going to [large HMO]. They are going to supply like me, like the information I need. So I think, there's some identification there, because my doctor is from there and he said basically like what's here . . . it's like kind of couple the two together.

To a lesser extent, some participants also gauged quality or accuracy of online information by whether it was congruent with their personal experiences.

Scope of reviewed web resources

Using a recent study on current offerings for online sexuality education, Marques et al. (2015), we compare popular sexuality education websites in the Marques study with those our participants encountered as part of their self-directed web searches. Our results show how often adolescent computer users are visiting websites devoted specifically to sexual health and sexuality education for sexual health information.

Approximately 1,429 total web pages were visited across the sample. Six out of the 14 sexuality education websites assessed in the Marques et al.

study were opened and viewed by users, and accounted for 8% of the total number of web pages viewed by the entire sample. The most common website from Marques et al. (2015) study list of popular sites was plannedparenthood.org, whose sponsored content appeared frequently. Planned Parenthood links were selected by 18 out of 30 users, only four of whom also visited any of the remaining five sexuality sites from the Marques et al. study that our participants viewed.

Discussion

This study establishes a framework for understanding how late adolescents find and evaluate online sexual health information. Themes outlined in this study contain key implications for how sexual health and sexuality educators may better maximize online sexual health knowledge portals to better reach this population.

Considering how our results compare to 14 well-known, acclaimed sexuality education websites, it was unexpected that adolescents viewed so few of these available on the internet. Exposure to sexuality education websites and other forms of high quality resources may be limited for users searching the web of their own accord if these resources do not appear at the top of results lists. Interventions designed to deliver comprehensive online sexual health information to adolescents may not reach their intended audience unless they appear early in search lists.

Therefore, quality online interventions must not only present valuable, relevant, and accurate content, but also must prioritize their placement on search engines and web rankings. Sexuality education website designers and program professionals must consider how readily their online interventions may be reached when evaluating impact. Programmers for intervention sites should invest in search engine optimization, which includes adding relevant keywords and phrases (metadata) on websites, and editing image tags to improve the chances that the website will be indexed by search engines. A search engine optimization strategy will help interventions appear in the top of results lists, and can be informed by our findings on the different search terms used by this age group. Given the sentiment against teen-friendly website designs among older adolescents, designers may also want to conduct user focus groups or otherwise assess how the design of their specific website may be perceived by older youth (McCarthy et al., 2012). Attempts to design sexuality education websites for "youth" or "adolescents" as a blanket demographic may in fact result in negative credibility assessments of the content they see. Older adolescents' informational needs about sex and sexual health are likely to reflect their increase in sexual activity and number of sexual partners as they develop into emerging adults, making a dismissal of accurate

but poorly framed content a significant opportunity lost for knowledge uptake. Furthermore, this is particularly significant given the strong emphasis in many youth health resources on tailoring online information based on perceived accessibility for target demographics.

It is not surprising that late adolescents consistently judged websites for their utility based on initial impressions about esthetics and ease of use. Website layout, appearance, color scheme and general organization widely influence credibility assessments (Fogg et al., 2001). Non-content cues about the quality and accuracy of a site, like design features, basic functionality, and presence of advertisements and pop-ups, were also part of their process for deciding whether to spend more time on a particular site, confirming key findings about web credibility assessment by Fogg et al. (2001), Sillence et al. (2004) and other researchers. Extraneous imagery and visual "noise" tempered the initial impressions our users had of what they hoped to glean from a particular site. Again, not surprisingly, dot-org, dot-edu, and dot-gov websites were considered more credible for reviewing sexual health information compared to dot-com sites, in line with research on how users assess the source of information as part of their credibility assessment thinking (Beldad, de Jong, & Steehouder, 2010; Isaacson, 2006).

It is noteworthy that credibility assessments of resources about sexual identity were distinct from other sexual health topics. Participants were sometimes more liberal or tolerant of errant displays or extraneous information on websites if the focal content of the site related to sexual identity confusion, the "coming out" process, sexual prejudice, or personal conflicts with one's own sexual identity (Sulfridge, 2013). Professional, authoritative design layouts with digestible text formats were valued for communicating credibility for most of the sexual health information users sought and found, but for sexual identity information, users seemed to tolerate more uncertainty when learning about other web users' experiences. Rather than becoming impatient and closing the site, users were more tolerant and ignored (clicked away) pop-up ads and filtered through extraneous text in order to read and evaluate posted content about sexual identity. Users were more likely to abandon sites with similar levels of visual noise that instead focused on STIs or contraception.

Many sexuality education websites do not discuss sexual development or sexual expression, which has been noted as a deficit of these interventions (Smith, Gertz, Alvarez, & Lurie, 2000). Yet our findings suggest this may not ultimately matter to this age group. When users wanted to find information about understanding sexual identity, they are not necessarily consulting sexuality education websites. Instead they search for vloggers, bloggers, and other individuals in the online community with strong reputations around sexuality issues. Sources of information about sexual identity will likely have more uptake among adolescent audiences if they are framed

with stories and first-hand adolescent accounts of what sexual maturation entails in their social networks and communities. Additionally, sexuality education websites may more effectively address sexual identity by referring users to other online personalities.

The consistency with which late adolescents in our sample corroborated information across various sources (personal experience, peers, offline information) draws attention to the need for reliable access to comprehensive sexuality education throughout adolescence and into emerging adulthood. Participants in our study tended to try to corroborate online sexual health information with offline sources, including previous classroom sexuality education and information from peers and health providers. Corroboration has been noted as a common evaluation strategy for assessing web content when the truth of the information may be either in dispute or unable to be verified objectively (Meola, 2004; Metzger, Flanagin, & Medders, 2010). It is highly likely young people have difficulty gauging quality and accuracy of sexuality and reproductive health information, given the inconsistent exposure and variation in quality of sexuality education in the United States. Educators and website developers in good faith have attempted to "meet young people where they are" by creating quality online destinations with sexual health information for adolescents and promoting traffic to those sites in recent years. Yet sexuality education websites should not be viewed as a panacea to reach adolescents on the internet, nor a stopgap measure as advocates push to expand classroom sexuality education. The need among this age group to corroborate sexuality information is high. As a result, sexual health content on general and commercial sites warrants scrutiny and attention. Often adolescents consulted a mix of general and commercial sites, education websites, and websites run by health and clinical service providers to make ultimate judgments. Practitioners working with young adults and advocates for clinical services for this age group can also use these key findings to highlight the importance of providing high-quality, accurate information through conventional means that adolescents may recognize or corroborate in their private online searches.

We have several limitations to disclose. First, participants were instructed during interviews to search for information on topics that were predetermined for the purposes of internal validity versus their own informational needs. Prompts were open to interpretation, but no topics outside of the four prompts were covered. It is unknown if participants in this study would have directed their own searches around different topics critical to adolescent development, including sexual pleasure. Second, users were an educated group of late adolescents who may be more likely to have adept online research skills than younger adolescents or those not enrolled in college. Our participants are likely to represent a highly internet-savvy

segment of the late adolescent population in the United States, reducing the generalizability of our findings in a broader context. Lastly, the lab where this research took place is arguably not a "natural" environment. Lab stations, while private, did not naturally mimic the conditions and settings of participants' own computers. While measures were taken to increase participant comfort, it is possible participants experienced social desirability bias while being interviewed, which may have affected the validity of their responses. With regards to data safety, conducting this study at an official lab provided safeguards for data security and ensured consistency of the research context across all participants.

Conclusion

This is one of the first known studies to examine how late adolescents find sexual health information using open, observational methods on the web (Buhi, Daley, Fuhrmann, & Smith, 2009). By articulating the process of young users online for this specific subset of health information, we may apply these findings to increase the visibility and ultimate impact of online interventions. The findings reported here have potentially important implications for the sexuality education advocacy arena and for those developing online sexual health interventions and educational websites. Future research is recommended to explore how educators may more effectively reach late adolescents with online sexual health interventions in rural or resource-poor settings in the United States. Future studies on this topic may also utilize newer methods of online sampling to broaden generalizability.

Acknowledgments

The authors thank Norman Constantine and Tamar Antin for their contributions to the framing of this study, and Riya Singh and Anand Marshall for their analytic contributions.

Funding

This study was supported by the National Science Foundation (Award no. 132270). Additional support was provided from the School of Public Health and the Undergraduate Research Apprenticeship Program (URAP) at the University of California Berkeley.

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