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Sexuality Education Websites for Adolescents: A Framework-Based Content Analysis

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The web has unique potential for adolescents seeking comprehensive sexual health information. As such, it is important to understand the nature, scope, and readability of the content and messaging provided by sexuality educational websites. We conducted a content analysis of 14 sexuality education websites for adolescents, based on the 7 essential components (sexual and reproductive health and HIV, relationships, sexual rights and sexual citizenship, pleasure, violence, diversity, and gender) of the International Planned Parenthood Framework for Comprehensive Sexuality Education. A majority of content across all sites focused on sexual and reproductive health and HIV, particularly pregnancy and STI prevention, and other information about STIs and HIV. No other topic comprised more than 10% of content coverage across a majority of sites. The authors found little discussion of gender issues, sexual rights, sexual diversity, or sexual violence. Most sites provided brief references to sexual pleasure, generally moderated with cautionary words. Language used implied a heterosexual female audience. Reading levels for most sites were above the 9th-grade level, with several at the college level. These findings have implications for enhancing online sexuality education and broadening the coverage of essential topics.

With 93% of adolescents visiting one or more websites on a daily basis, the web has considerable potential to help meet adolescent sexuality and sexual health information needs (Lenhart, Purcell, Smith, & Zickuhr, 2010). In one nationally representative survey, 62% of 15–18-year-olds reported having looked up health information on the web (Rideout, Foehr, & Roberts, 2010).

There are several advantages of offering sexuality information to adolescents online, including ease of finding information, ability to connect to peer experiences, and convenience of time and place. Furthermore, it allows users to browse for answers to their sexual health questions privately and anonymously, and to focus on topics of interest to them (Rideout, 2001). Adolescents typically put considerable trust in search engines for finding general and health information (Eysenbach & Kohler, 2002; Hargittai Fullerton, Menchen-Trevino, & Thomas, 2010), which might expose users to inaccurate or irrelevant information when seeking information about sexuality.

Web-based information has been reported to lead to behavior change and accessing health services, with more than half of youth ages 15–17 years reporting having a conversation with a health care provider (Rideout, 2001), and

over a third reporting having changed their behavior because of information they found online (Ybarra & Suman, 2008). Recognizing the potential of the web for communicating sensitive health information, many organizations have created sexuality education websites tailored to adolescents (Isaacson, 2006).

Authors of recent studies of sexuality education websites have reached mixed conclusions about their quality and scope, noting content inaccuracies (Buhi, Daley, Fuhrmann, & Smith, 2009; Tietz, Davies, & Moran, 2004), incompleteness (Bay-Cheng, 2001; Smith, Gertz, Alvarez, & Lurie, 2000; Whiteley, Mello, Hunt, & Brown, 2012), lack of an underlying theoretical framework (Noar, Clark, Cole, & Lustria, 2006), poor usability (Keller, Labelle, Karimi, & Gupta, 2002; Whiteley et al., 2012), and minimal interactivity (Noar et al., 2006; Whiteley et al., 2012) among sexuality education websites. Furthermore, even accurate health information has been shown to be misinterpreted if it is presented unclearly or in a developmentally inappropriate way (Kanuga & Rosenfeld, 2004).

Although there are no existing guidelines for online sexuality education, many experts endorse comprehensive approaches over those that are more narrowly focused. Going beyond abstinence-only and abstinence-plus approaches, true comprehensive sexuality education maintains a broad, holistic, and positive view of sexuality by addressing a range of issues and including growth and development, gender, sexual orientation and identity, love, sexual health problems, sexual

attraction and pleasure, parenting, sexual and reproductive rights, and more. Comprehensive sexuality education recognizes that sexuality is a lifelong facet of human experience, and a potential source of pleasure, which needs to be understood and appreciated for better mental, physical, social, and spiritual health (Goldfarb & Constantine, 2011; Marques, Constantine, Goldfarb, & Mauldon, 2015; National Guidelines Task Force, 2004).

Consistent with this perspective on comprehensive sexuality education, several frameworks offer definition to this approach. Three highly respected international organizations (International Planned Parenthood Federation [IPPF], 2010; United Nations Population Fund, 2010; World Health Organization, 2010), and two US-based committees of experts (Future of Sex Education Initiative, 2011; National Guidelines Task Force, 2004) have elaborated frameworks or standards for comprehensive sexuality education. Common to each of these frameworks is a shift away from an exclusive focus on biological and reproductive aspects of sexuality, to a more comprehensive, human developmental approach—one that addresses sexuality holistically and within the context of emotional and social development. These are the hallmarks of comprehensive sexuality education (Goldfarb & Constantine, 2011).

Although each of these frameworks offers valuable guidance to Comprehensive Sexuality Education, the International Planned Parenthood Federation's (2010) *Framework for Comprehensive Sexuality Education* (IPPF Framework) is especially well suited to providing an analysis framework for this study. Of the internationally recognized frameworks, the IPPF Framework includes the most specific yet concise detail delineating its recommended content areas. It defines seven essential components of comprehensive sexuality education: sexual and reproductive health and HIV, relationships, sexual rights and sexual citizenship, pleasure, violence, diversity, and gender. While these are largely consistent with the other frameworks, IPPF's explicit inclusion of sexual rights and sexual citizenship reflects the growing influence of the international community on the field of sexuality education over the past decade.

Method

This study employed content analysis guided by the IPPF Framework to examine the nature, scope, and content for a sample of 14 popular adolescent-oriented sexuality education websites. Two primary research questions were addressed: (a) To what extent are each of the IPPF Framework seven essential components covered by these websites? and (b) What additional sexuality topics are covered on these websites? We also examined the readability level of each websites' written text.

Sampling

We conducted an exhaustive systematic search of websites in July 2011 using the Google search engine. We searched using the keyword phrase *sex education website for teens*. The initial search yielded over seven million results. Of these,

the first 200 results were reviewed, based on a similar approach used by Keller, Labelle, Karimi, and Gupta (2002). All websites were reviewed for eligibility according to the following criteria: (a) currently active (not a dead link), (b) original content (content not duplicated from another website), (c) open access (does not require a login or fee), (d) English language, (e) orientated toward adolescents (refers to adolescents in the site's mission statement or description), (f) includes information on more than one sexuality topic, and (g) primary focus on sexuality education. Ineligible websites included those focused on marketing sexuality education curricula and those focused on policy or advocacy, as well as those consisting of lists of referral URLs. Ten of the initially reviewed websites met these selection criteria.

To reduce the likelihood of missing relevant eligible sites, snowball sampling was also employed. Forty-three of the initial 200 websites contained links to other recommended sexuality education websites, and four of these additional sites were eligible. The final sample consisted of 14 websites, referenced as websites 1–14 (see Table 1).

Content Selection

We saved each website between August 1, 2012, and October 1, 2012 using WinHTTrack Website Copier (Roche, 2012). All of a website's text was saved, while pictures and interactive aspects of the site were omitted.

To address the wide variety in website formatting and amount of content, a protocol was established to identify what text from each site would be included in the analysis. To maintain consistency of search results, we began with the page accessed through the URL from our original search results (e.g., <http://www.amplifyyourvoice.org/mysistahs> rather than <http://www.amplifyyourvoice.org>). We first reviewed the starting page for content and then sequentially opened each hyperlink provided on that starting page until a codeable statement was found. A codeable statement was defined as one that offered enough content and context to assess, typically a paragraph or more. When a hyperlink did not produce sufficient content, we clicked through

Table 1. Sampled websites

-
1. <http://www.plannedparenthood.org/info-for-teens>
 2. <http://www.teensource.org/pages>
 3. <http://www.myelsie.org>
 4. <http://www.stayteen.org>
 5. <http://www.iwannaknow.org>
 6. <http://www.scarleteen.com>
 7. <http://www.sexualityandu.ca>
 8. <http://www.likeitis.org/indexuk.html>
 9. <http://www.positive.org/Home/index.html>
 10. <http://www.itsyoursexlife.com>
 11. <http://www.b4udecide.ie>
 12. <http://www.sexetc.org>
 13. <http://www.avert.org/teens.htm>
 14. <http://www.amplifyyourvoice.org/mysistahs>
-

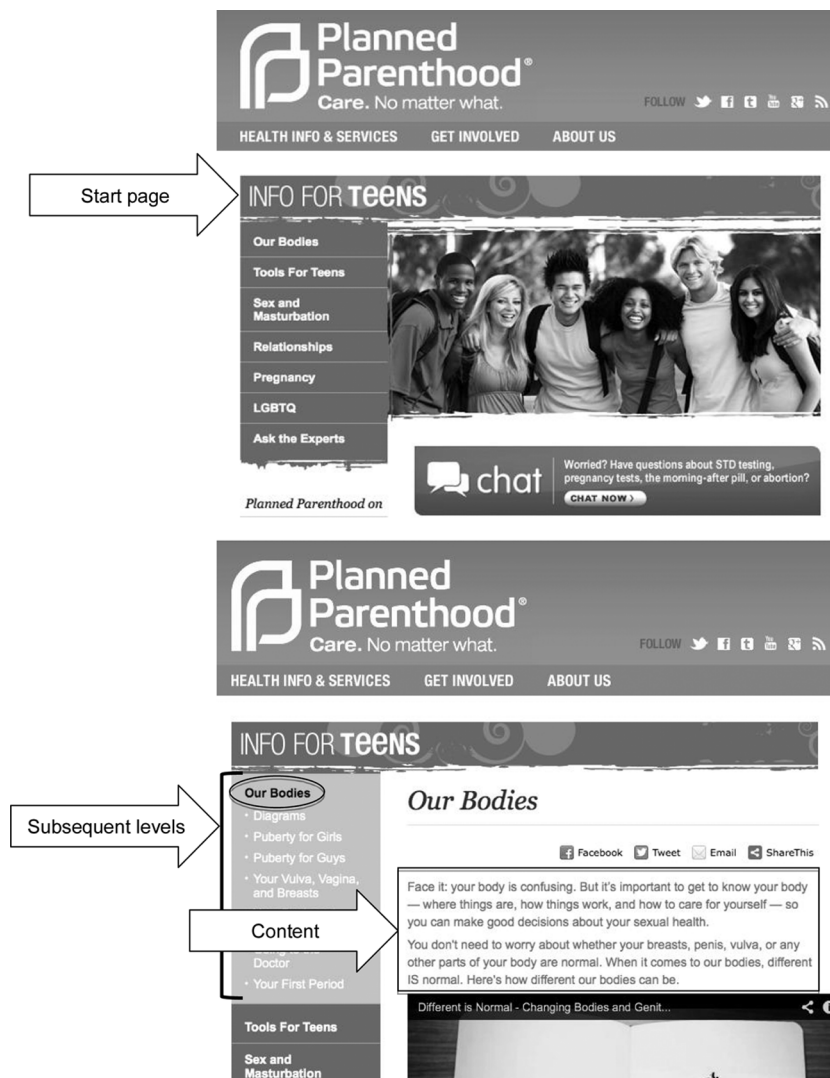


Fig. 1. Example of content identification.

subsequent hyperlinks until a page with sufficient text was identified. For each page that was reviewed, all hyperlinks from it were selected and reviewed for content (see Figure 1).

Content Analysis

We employed seven primary content categories to represent the seven essential components of comprehensive sexuality education from the IPPF Framework: (a) sexual and reproductive health and HIV, (b) relationships, (c) sexual rights and sexual citizenship, (d) pleasure, (e) violence, (f) diversity, and (g) gender (see Table 2). Subsequently during a pilot coding process, we developed five subcategories to further distinguish content within the primary category of sexual and reproductive health and HIV, and two subcategories within the primary category of relationships. Five additional primary categories were developed during pilot coding for content outside of the IPPF Framework essential components: (a) psychosocial factors, (b) expression of sexuality, (c) support networks and services, (d) sexual development, and (e) other.

Content was assigned multiple categories or subcategories as appropriate. The codebook was iteratively modified throughout planning and piloting stages, and no further changes occurred after the completion of pilot testing in order to maintain consistency across all coding activity. Coding was carried out from September 2012 to October 2012 by five independent coders, using the qualitative analysis software ATLAS.ti (Muhr, 2011). Coders were trained on the codebook and supervised by the first author. Discrepancies that emerged during the coding process were resolved by consensus.

Once coding was completed for all 14 websites, ATLAS.ti code occurrence and co-occurrence tools were used to analyze the distribution of coded content. Proportions of content for each code were calculated by dividing the number of coding instances for a code category or subcategory by the total number of coded instances within the full sampled sections of the website. This allowed for comparisons of relative distributions of categories across websites. Emergent themes were initially identified through code occurrences

Table 2. Content categories and definitions

Primary category and subcategory	Definition
IPPF essential component	
Sexual and reproductive health and HIV	
Pregnancy and STI/HIV prevention	Prevention of pregnancy, STIs, and HIV, including but not limited to condoms, condom skills, contraception, and other non-medical forms of prevention.
Other STI/HIV content	STIs and HIV, including but not limited to biological aspects of STIs and HIV/AIDS: HIV voluntary counseling and testing, STI screening, non-sex-related (e.g., mother to child or through injection drug use) transmission, prevention, treatment (e.g., HIV antiretroviral therapy, STI treatment), and care and support (e.g., living with HIV).
Sexual behavior	Sexual behaviors, including but not limited to masturbation, oral, anal, and vaginal sex, the use of technology, and myths and facts about sexual behaviors.
Biology	Biological aspects of sex and sexuality, including but not limited to anatomy, reproductive processes, sexual response, sexual problems, and myths and stereotypes that relate to these.
Other pregnancy content	Pregnancy, including information about pregnancy and pregnancy options (abortion safety, abortion values, abortion regulation, adoption, adoption regulation, and parenting).
Relationships	
Peer relationships	Relationships between peers, including those that are sexual and non-sexual, recognizing healthy and unhealthy relationships, and communication.
Parent relationships	Parent and caregiver relationships including but not limited to parent-child communication, problems between parents and their children, fostering trust between parents and their children, and support for parents.
Pleasure	Pleasure, including but not limited to characteristics of pleasure, the behavior and biology of pleasure, the ranges of expression of pleasure, desire and arousal, and stigma related to pleasure.
Sexual rights	Sexual and reproductive rights and sexual citizenship, including but not limited to participation in sexual and reproductive rights, and skills for engaging in sexual and reproductive rights and citizenship.
Violence	Violence related to sex and sexuality, including but not limited to biased-based violence, support options and seeking help, preventing violence, and understanding the dynamics of victims and abusers.
Diversity	Diversity, including but not limited to recognizing and understanding the range of diversity; a positive view of diversity; and recognizing discrimination and its effects, and dealing with it.
Gender	Gender, including but not limited to the difference between gender and sex, gender roles and attributes, gender bias, stereotypes, inequality, and gender identity.
Other primary categories	
Psychosocial factors	Social, emotional, and cognitive factors that might influence sex and sexuality.
Support network and services	Support networks available to the reader, including but not limited to psychosocial and health services, counselors, peers, teachers, parents.
Expression of sexuality	Ways that people might experience their sexuality or display it to themselves or others.
Sexual development	Sexual development throughout the lifespan.
Other	Topics that are not covered by other codes.

Note. IPPF = International Planned Parenthood Federation. STI = sexually transmitted infection.

and co-occurrences, and then iteratively explored across websites to assess their ubiquity. Coder-generated memos and regular research team meetings were used to corroborate and elaborate emerging themes throughout the analysis process.

Readability Analysis

Readability analyses estimate the literacy level required for a reader to grasp and comprehend the information presented

in a block of text (DuBay, 2004). For this purpose we employed the Gunning Fog readability index (Gunning, 1969). The Gunning Fog assesses the ratio of polysyllabic to overall words in a sentence, resulting in a grade-based score ranging from fourth grade to college level. It has been used to evaluate a wide range of health-related materials, including online health information (Gunning, 1969; McInnes & Haglund, 2011) and patient education materials (Cherla et al., 2013; Edmunds, Barry, & Denniston, 2013; Stossel, Gliatto, Fallar, & Karani, 2012; Yin et al., 2012).

Table 3. Proportion of content representing IPPF essential component categories and subcategories

Primary category or subcategory	Website														All
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	
Sexual and reproductive health	.38	.77	.50	.45	.60	.29	.52	.52	.53	.80	.48	.42	.50	.61	.53
Pregnancy and STI/HIV prevention	.04	.38	.23	.21	.10	.04	.16	.11	.18	.27	.06	.10	.11	.12	.15
Other STI/HIV content	.03	.30	.07	.06	.30	.06	.15	.09	.14	.33	.07	.06	.07	.16	.13
Sexual behavior	.10	.02	.10	.03	.05	.08	.05	.06	.07	.08	.26	.16	.19	.22	.10
Biology	.18	.03	.05	.09	.13	.07	.14	.17	.05	.10	.07	.05	.12	.06	.09
Other pregnancy content	.03	.05	.05	.06	.02	.05	.03	.09	.08	.02	.02	.05	.01	.05	.04
Relationships	.10	.05	.10	.18	.09	.15	.09	.06	.07	.05	.22	.12	.10	.14	.11
Peer relationships	.07	.04	.09	.18	.08	.14	.08	.04	.04	.00	.01	.02	.01	.02	.06
Parent relationships	.03	.01	.01	.01	.02	.01	.01	.02	.03	.05	.21	.10	.08	.11	.05
Pleasure	.04	.00	.03	.00	.01	.04	.02	.04	.08	.00	.09	.08	.03	.01	.03
Sexual rights	.03	.04	.04	.01	.04	.03	.02	.04	.08	.00	.01	.01	.06	.01	.03
Violence	.01	.01	.04	.05	.03	.04	.04	.00	.03	.00	.01	.02	.03	.00	.02
Diversity	.03	.00	.00	.01	.01	.00	.02	.00	.00	.00	.02	.09	.01	.08	.02
Gender	.02	.01	.02	.00	.00	.01	.02	.01	.01	.00	.01	.05	.01	.01	.01

Note. IPPF = International Planned Parenthood Federation. STI = sexually transmitted infection.

Results

Of the 14 websites, 13 contained information about its sponsors or owners: 3 were sponsored or owned by advocacy organizations, 3 by clinical providers, 3 by nonprofit organizations, 2 by academic institutions, 2 by nonclinical medical organizations, and 1 by an entertainment company. Among the sites that credited their content, references ranged from general (e.g., a team of interdisciplinary health experts) to very specific (e.g., a person’s name, title, and institution). Three sites included and referenced material written by teens.

Alignment with IPPF Framework

Seventy-five percent of sampled content across the 14 sites fell within the IPPF Framework seven essential components, with a majority of content falling in the sexual and reproductive health and HIV primary category (53%). Nine of the 14 sites focused at least half of their content on this topic (see Table 3). Considering more specific subcategories within this category, 15% of all content involved STI/HIV and pregnancy prevention, 13% involved other STI/HIV information, 10% sexual behavior, 9% biology, and 4% other pregnancy information (see Table 3). The second most common primary content category was relationships (11%), comprising peer relationships (6%) and parent relationships (5%).

Although most websites addressed all or most of the five remaining IPPF Framework essential components, they did so to a much lesser extent. Content on pleasure (3%) included enjoyable aspects of sexual activity, both physical and emotional. Content on sexual rights (3%) addressed a young person’s right to contraception, freedom of sexual choice and expression, as well as legal issues related to sexual activity, such as age of consent. Discussions of violence (2%) included recognizing forms of physical, emotional or psychological, and sexual partner abuses, and how to seek help from sexual violence. Content on diversity (2%) primarily comprised promoting understanding of the range of sexual identities, as well as raising awareness of discrimination based on sexual orientation, race and ethnicity. Last, content on gender (1%) addressed expressions of masculinity and femininity and one’s identity as male, female, or transgender.

Other Content

Almost one quarter of sampled content across websites fell within the five categories outside of the IPPF Framework essential components. Psychosocial factors (10%), support networks and services (6%), and expression of sexuality (5%) were most prevalent, whereas sexual development (2%) was covered less frequently (see Table 4). Much of

Table 4. Proportion of content representing other primary categories

Other primary category	Website														All
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	
Psychosocial factors	.16	.02	.12	.21	.09	.33	.12	.09	.06	.00	.01	.05	.08	.02	.10
Support networks and services	.11	.08	.08	.08	.09	.04	.08	.15	.09	.00	.01	.02	.01	.00	.06
Expression of sexuality	.05	.00	.05	.00	.03	.03	.05	.03	.04	.13	.08	.09	.07	.09	.05
Sexual development	.07	.00	.01	.00	.02	.02	.02	.02	.00	.01	.04	.04	.06	.03	.02
Other	.00	.01	.00	.00	.00	.02	.00	.03	.00	.00	.01	.01	.05	.01	.01

the content within psychosocial factors included issues of peer pressure and decision-making related to sex. Eight of the 14 websites contained content on support networks and services, focusing primarily on referring users to providers for contraceptive or STI/HIV testing services, or other types of supports, such as counselors. Content within the expression of sexuality category largely focused on discovery of sexual orientation and coming out, behavioral expressions of sexuality, generally with an emphasis on masturbation or noncoital behaviors, and differentiating feelings of love and desire.

Emergent Themes

Four primary themes emerged from the analyses of the content categories: (a) saying “no” to sex, (b) constrained characterizations of pleasure, (c) target-age issues, and (d) heterosexual female focus.

Saying “no” to Sex

With content related to sexual initiation, a common strategy across websites was to provide criteria to help the reader gauge their readiness to have sex for the first time, often in the form of a list of questions or a checklist. Eight of the 14 websites (1, 3, 4, 5, 6, 11, 12, 13) used this format. Checklists posed questions or provided hypothetical scenarios. The focus typically was on assessing reader readiness to engage in sex, for example:

Deciding whether to have sex is a highly personal decision. It can be influenced by a variety of factors, which may include religious, spiritual, and moral beliefs; family and personal values; personal desire; peer influence; and/or your relationship with a potential sex partner. It’s important to think about where you stand on the issue. Here are a few questions to ask yourself before you decide: Do we both believe or not believe that sex should only be shared in a marriage or other committed relationship? Do we both believe or not believe that two people should be in love before having sex? (1)

Typically, there appeared to be an implicit assumption that the reader did not want to engage in sexual behavior with a partner. This was primarily evidenced through scenarios that focused on how to say “no,” not succumbing to external pressures to have sex, and the potential negative consequences of having sex. For example:

Remember, you don’t have to give someone a reason as to why you don’t want to have sex with them. It’s enough for you to say: ‘No, I’m not doing it. I don’t want to.’ (11)

Two main reasons were commonly provided to justify avoiding sex. The first focused on the potential for disease and pregnancy:

Having sex for the first time can be a very special experience, but it can also lead to all sorts of complications. Sex without a condom or other forms of contraception can

result in pregnancy, and if your partner has HIV or a sexually transmitted infection (and you might not always know they do), you can become infected too. (3)

The second reason focused on emotional consequences, including feeling regretful:

Saying ‘no’ is not always as easy as it sounds. This is mainly because we often worry about what people will think of us, we want to be liked and fit in. But you need to consider this: Taking the easy option and doing what your friends/boyfriends want you to do may mean doing something that you will regret and have to live with. (8)

Legal reasons, including the age of consent, also were sometimes mentioned as additional justifications to avoid sex:

Legally, you aren’t allowed to have sex with anyone until you’re over the age of consent . . . The age of consent laws always apply, whether you’re in love, or you’ve been together for ages, or you’ve had sex before. (3)

Although found on only a minority of websites, fear-based language was sometimes used to persuade readers to postpone sexual intercourse, for example:

First time sex is always going to be scary whatever age you are when you have it. (13)

Constrained Characterizations of Pleasure

Although only 3% of overall content dealt with sexual pleasure, 11 of 14 websites (see Table 3) did address some aspect of sexual pleasure. The focus on most sites was primarily on the biology of pleasure:

There are certain physical, hormonal and psychological mechanics that come into play when it comes to human sexual response, and understanding those is essential to lay the foundation for understanding how sex works for ourselves and for our partners. (6)

Across most websites much of the content on pleasure aimed at normalizing and, in some cases, encouraging masturbation as a way to achieve pleasure.

The myth is that it’s abnormal for children to masturbate. The truth is that masturbation is a perfectly healthy activity at any age . . . It’s not at all unusual for young children to masturbate. Often parents will stop them from doing it in front of other people, but many children continue to masturbate on their own. In fact, experts recommend that parents teach children that it’s normal for people to touch their sex organs for pleasure—but that it should be done in private. (1)

Websites provided more explicit information about how to achieve pleasure through masturbation than through

other sexual behavior. Furthermore, mutual masturbation was sometimes lauded as a safe way to achieve sexual pleasure:

Mutual masturbation or body rubbing has a variety of advantages. It's safe, with no risk of pregnancy or infection. Non-penetrative sex also reduces the pressure to perform. (3)

In addressing other sexual behaviors, particularly intercourse, websites generally avoided or merely alluded to the concept of pleasure. Typically, sex was described as possibly being “fun,” “enjoyable,” or a “special experience.” These statements were often accompanied by statements of caution about the risks of sexual behavior, or qualified by a need to use protection (i.e., condoms and/or contraceptives) for sex to be enjoyable:

Practice Safe Sex, so you won't have to worry about STDs and STIs, and sex will be a lot more fun. (9)

Furthermore, the tone used in discussing sexual pleasure often varied by gender reference, with more precautionary phrasing for female-focused as opposed to male-focused topics:

Breasts can give you a lot of sexual pleasure. They are basically ‘freebies,’ since you can't get pregnant or catch a sexually transmitted infection by going to ‘second base.’ (1, from section on female anatomy)

Boys and men become sexually excited by sexual thoughts, wet dreams, masturbation, or sexual activity with another person. (1, from section on male anatomy)

Target Age Issues

By design, sites were selected based on their focus on adolescent sexuality education, but a specific intended audience age range for the majority of sites was unclear. Some websites appeared to have been tailored to a presumed young, tech-savvy audience. An abbreviated writing style used in texting and online chatting was found on some of the sites:

How 2 get emergency contraception? If u r under 17 u can get a prescription. 17+ just go 2 the drug store! (2)

Some sites contained content with simple vocabulary and language structure, most appropriate for younger readers:

Girls can get pregnant the first time they have sex. Girls can get pregnant if they have sex standing up. Girls can get pregnant during their period. Keeping your eyes closed does not prevent pregnancy. If a boy doesn't have sex his testicles will not explode. (11)

Yet, most sites used a more sophisticated tone and higher-level language, for example:

Emergency contraceptives work by delaying or inhibiting the release of an egg (ovulation), altering the luteal phase length, and also possibly inhibiting the implantation of a

fertilized egg. In the unlikely event that implantation does occur, EC does not interrupt the pregnancy or put the fetus at risk. (7)

Gunning Fog grade level readability indices ranged across the websites from Grade 8 to Grade 15, with a median reading level of Grade 11. Four sites employed language more suited to postsecondary education, and 9 of the 14 sites were above ninth-grade level (see Figure 2).

Heterosexual Female Focus

One website (14) explicitly stated a focus on girls and young women, and a majority of content represented on several other websites (2, 4, 5, 6, 7, 8, 13) also appeared to prioritize a female audience, although this was not explicitly stated. No sites appeared to prioritize a male audience. The assumption of a female audience was evidenced by both a preponderance of female-oriented topics out of the total content on most sites, and a prioritization of female-oriented content displayed first in sections that pertain to both genders. For example,

It's impossible for a doctor to examine a girl and tell if she is a virgin. A lot of discussion about virginity is about girls. (12).

This assumption also was illustrated by use of *you* in many discussions aimed at females and use of *they* or *he* in male-related topics. Female-prioritized content was most noticeable in sections on pregnancy, contraceptives, and deciding to have sex.

A common strategy in presenting content specifically for males—as well as lesbian, gay, bisexual, and transgender audiences—was to include separate sections focused on these groups (e.g., Puberty for Guys [1], Am I a Lesbian? [13], Coming Out to Parents [7]). Use of heteronormative language (language that assumes heterosexuality among readers) differed across websites, with most sites using a mix of inclusive language (e.g., “Whatever sort of vaginal entry we're talking about—with fingers, a penis or a dildo,

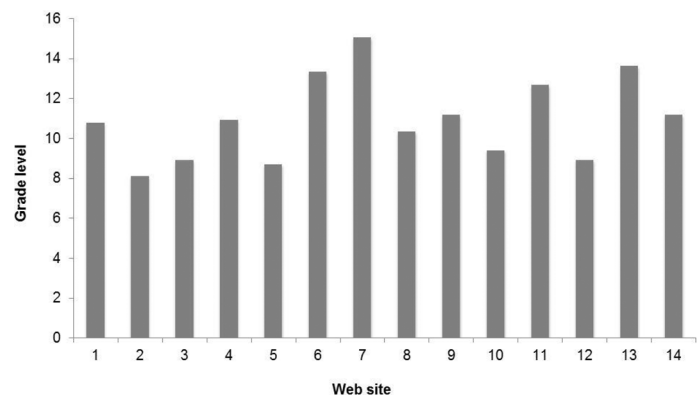


Fig. 2. Gunning Fog Index grade-level readability. Grade-level readability analysis conducted using the Gunning Fog Index for written English (http://www.online-utility.org/english/readability_test_and_improve.jsp).

with partners of any gender—not only doesn't have to be painful, it really shouldn't be." [6]) and exclusive (e.g., "Does it hurt? No, though sex for the first time can be painful for a girl, as the penis breaks through the hymen." [8]). Four of the sites (9, 10, 11, 12) consistently used language that aimed to address multiple sexual orientations and identities.

Discussion

This study assessed the nature, scope, and readability of a sample of 14 popular adolescent-oriented sexuality education websites. Although the Internet offers the potential to alter and expand sexuality education, these findings suggest that this potential is not being fully realized. Similar to most traditional classroom-based sexuality education, the focus of the websites in this study was on basic sexual and reproductive health topics, largely comprising prevention of and other information about STIs, HIV, and pregnancy, with consistent but much less attention to sexual behavior, the biology of sex, and relationships with peers and parents. Coverage of the other five IPPF Framework essential components—pleasure, sexual rights, violence, diversity, and gender—was minimal overall, and with few exceptions, minimal within each individual site.

The 24% of content across websites that fell beyond the essential components of the IPPF Framework included both traditional content emphasizing prevention of negative outcomes, as well as content that went beyond both traditional sexuality education and the IPPF Framework. Overall, this large proportion of non-IPPF Framework content suggests a lack of complete agreement on which elements of comprehensive sexuality education are considered most essential and suggests a possible need for some revision or expansion to the IPPF framework.

The focus on peer pressure and decision making related to having sex, typically conveying that the reader did not want to engage in sex (with much of the focus on ways to say no), and that the best decision should be to avoid sex mirrors that of traditional classroom-based sexuality education. In combination with the minimal attention paid to sexual rights and violence, and Keller, Labelle, Karimi, and Gupta's (2002) finding that websites containing information on HIV/STD had minimal discussion of sexual negotiation, this suggests a significant gap in information on navigating sexual decisions for adolescents who are currently engaging in sexual behavior.

Yet, that all seven of the IPPF Framework essential components were at least minimally covered by most of the websites is encouraging. With most school- and community-based sexuality education curricula focusing on abstinence or abstinence plus contraception and STI protection (Goldfarb & Constantine, 2011), websites can be a critical source of sexuality education information and support that are more comprehensive. Although more thorough, wide-ranging, and inclusive than typical classroom-based curricula, most of the reviewed websites had significant omissions.

Many websites included some mention of sexual pleasure, yet these statements tended to be positively framed only regarding masturbation, and varied based on the assumed gender of the audience. Similar to findings in this study, Lamb, Lustig, and Graling (2013) also noted the constrained characterizations of pleasure in sexuality education, referring to this representation of pleasure as "problematic pleasure," and noting that this type of characterization is not meant to enhance self-knowledge, but rather to communicate that pleasure is an "obstacle to restraint, abstinence and health" (p. 312). Although both sexes received information about the normalcy of feeling sexual pleasure, girls were more explicitly cautioned about acting on their desires, whereas boys were given more neutral messages about pleasure. The divergent messages around pleasure by sex are consistent with and reinforce gender norms that expect young women to be gatekeepers of sexual behaviors while normalizing pleasure for young men. Such norms can have a negative influence on the sexual development of both sexes (Bay-Cheng, 2001; Tolman, 2000; Welles, 2005).

The U.S. National Library of Medicine recommends that to promote attention and comprehension, general population health materials should be written within the sixth- to seventh-grade reading level (MedlinePlus, 2013). Our finding that all 14 of the analyzed websites exceeded this level—by four full grades on average—reveals a significant problem that has been heretofore largely ignored. It is arguable that potential users who might most benefit from access to quality sexual health information are also least likely to have above average reading levels, and thus most likely to be excluded due to attention and comprehension challenges. Furthermore, several sites written at high reading levels focused on topics more relevant to younger audiences. For example, some sites spotlighted issues around the postponement of sexual initiation and cautions against peer or partner pressure to do otherwise. With the websites' 11th-grade (ages 16–17 years) average reading level, this emphasis is not developmentally appropriate, as a majority of U.S. 11th graders have engaged in sexual intercourse (Centers for Disease Control and Prevention, 2011). Such a reader is more likely to discredit the website when the content is not relevant, whereas younger readers for whom the content is more relevant are likely to find it inaccessible.

The implicit focus on young heterosexual women found across many sites might be a reflection of who most commonly seeks sexual health information online (e.g., Gilbert, Temby, and Rogers, 2005), or an attempt by the website developers to be more purposeful in their conveyance of information. Although targeting health promotion to specific audiences is generally considered good practice, doing so without notifying the reader of this intention may be misleading and present obstacles to nontargeted readers' accessing and interpreting information. In addition, the segregation of information may reinforce existing stereotypes about males, as well as sexual minority youth. Many adolescents are actively exploring their sexual identity and thus might not yet identify with a particular label. This suggests that they would likely benefit from language that

includes and normalizes the spectrum of sexual identities and behaviors.

The majority of websites appeared to make a deliberate effort to be inclusive of different sexual orientations, identities, and genders, and to address specific issues for these populations. Nevertheless the common assumption of a heterosexual female audience—including separate sections for content of specific interest to males and to sexual minority youth, reinforces an erroneous and harmful belief that girls are ultimately responsible for decisions about and consequences from sexual expressions and behaviors whereas boys and nonheterosexual youth are secondary audiences.

Our results and interpretations should be considered in light of several limitations. First, the search terms used to identify the websites do not necessarily reflect terms that adolescents might be expected to use. As such, sites identified in an adolescent's search might differ from those we selected. Furthermore, adolescents were not involved in validating our coding or analyses. Second, our method of capturing website content was limited to written language. Although outside the scope of this project, other potentially important website objects such as images, videos, and social media interaction could provide further insight into website content in future studies. Third, a number of overlapping Comprehensive Sexuality Education frameworks and standards are available. While some experts might favor a different set of criteria, the IPPF Framework provided the most specific yet concise detail delineating its recommended content areas. Yet, although the IPPF Framework specifies the various topics deemed important for comprehensive sexuality education, it provides little guidance on an appropriate relative distribution of content across categories. This study does not attempt to rate websites against a recommended distribution of content. Rather, we report the distribution of content by category as an indicator of the level of comprehensiveness of each site. Furthermore, this study focused on websites that addressed more than one aspect of sexuality. However, not all sexuality education websites are intended to be comprehensive. For these sites, it is imperative that they be explicit about their goals so that viewers are aware of the limitations of their information. Although this study primarily focused on content, representing one aspect of website quality, additional study of web site usability, navigability, interactivity, and medical accuracy would provide further insight on the quality of these websites.

Despite these limitations, the findings reported here have important implications for sexuality education website development and improvement. Because the Web can fill a unique role for adolescents seeking sexual health information, the topics that sexuality education websites cover—and what they leave out—are a measure of the degree to which many young users access a full range of relevant and accessible comprehensive information. Curriculum-based sexuality education is often dominated by negative discourse, focusing largely on pregnancy and disease prevention while minimizing discussions of such essential topics as sexual expression, diversity, and pleasure.

Because sexuality educational websites are not subject to the level of political, policy, and funding pressures of many school districts and community agencies, they have a unique potential to align with more ambitious guidelines for comprehensive sexuality education. This potential is not being fully realized. Expanding the range of content of sexuality education websites is an essential step toward meeting this potential.

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