

## EDUCATION

# Acceptability of a Comprehensive Sex Education Self-Study Website for Teaching Reproductive Health: A Pilot Study Among College Students and Obstetrics and Gynecology Resident Physicians



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## ABSTRACT

**Introduction:** There is a growing interest among adolescents to obtain sexual health information online, which could be helpful in rural areas where adolescents face unique obstacles to contraception access, and medically accurate sex education is not mandated.

**Aim:** This study piloted a comprehensive sex education self-study website among undergraduate students and resident physicians to assess the accuracy and feasibility for future use in younger adolescents.

**Methods:** A sex education website developed by a board-certified obstetrician-gynecologist (OBGYN) was piloted among a group of OBGYN resident physicians and undergraduates from West Virginia. Groups were chosen to assess the accuracy of information and acceptability for use in younger adolescents. The 30-minute curriculum was a series of short videos (2–4 minutes each) covering anatomy, physiology, sexuality, gender identity, relationship health, contraception, and sexually transmitted infection prevention. Data were obtained on subjects' past experience and perception of sex education. Subjects also evaluated the website for usefulness and accuracy.

**Outcomes:** Main outcomes included a Likert scale assessment of each curriculum session's usefulness, accuracy, and how easy it was to follow.

**Results:** 24 subjects (14 undergraduates and 10 physicians) participated during September and October of 2019. All except for 1 subject had sex education taught in school; 11 (45.8%) reported it to be "low quality"; 23 (95.8%) reported being taught in a classroom. Individual website video sessions were reported to be highly accurate, very easy to follow, and very useful. All subjects (100%) felt that high school adolescents would be interested in the self-study website.

**Conclusions:** A self-study website was successfully tested and found to be a well-accepted way to teach sex education among this pilot group. Future work involves testing this tool among younger adolescent subjects.

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**Key Words:** Sex Education; sexual Health; ebsite; ontraception; ural; echnology

## INTRODUCTION

Comprehensive sex education should be medically accurate, evidence-based, and age-appropriate. Sex education taught in the

school setting, however, can be highly variable on the topics covered, the expertise of the individual providing the teaching, and state requirements.<sup>1</sup> In West Virginia, comprehensive sex education is required; however, there is no mandate on medical accuracy.<sup>2</sup> While there is a variety of curriculum for comprehensive sex education that is evidence-based by the Department of Health and Human Services,<sup>3</sup> most of these are in-person curriculum that lasts over several class meetings for multiple sessions. As digital tools become more accessible, there is a growing interest among adolescents to obtain sexual health information online using computers, smartphones, or other web-based platforms.<sup>4</sup> In the United States, 95% of adolescents age

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12–17 use the Internet, and 74% have access to mobile Internet devices.<sup>5</sup> Internet resources, however, must be used with caution, as search engines may include inappropriate websites or pornography or may include inaccurate information. In a study evaluating YouTube content for accuracy about the intrauterine device contraceptive, one-third of the videos analyzed had inaccurate information.<sup>6</sup> A similar study looking at YouTube content about the subdermal implant contraceptive found 26% of patient testimonial videos contained misinformation.<sup>7</sup>

Adolescents remain a high-risk population in regards to sexually transmitted infection (STI) acquisition and unplanned pregnancy. Individuals aged 13–24 account for nearly half of the 20 million new STI cases and more than 20% of the new HIV diagnoses each year in the United States.<sup>8</sup> Furthermore, girls aged 15–19 have higher rates of unintended pregnancy compared to women in older age groups.<sup>9</sup> Adolescent pregnancy varies by state, and in states such as West Virginia, the adolescent pregnancy rate is higher than the national average (27 pregnancies per 1,000 adolescents compared to 18/1,000 nationally).<sup>10</sup> In a recent meta-analysis evaluating 16 studies on over 11,000 adolescents, a positive effect was found on technology-based sexual health interventions for improving 2 key sexual behaviors: condom use and delaying sexual activity. However, among the included studies, there was wide variability in the length of intervention and type of technology used.<sup>4</sup> Other researchers have promoted the promising impact of technology-based interventions on sexual health and found that impact may be stronger when interventions tailor materials to the needs of specific participants.<sup>11,12</sup>

Previous studies have demonstrated that the rural adolescent population in West Virginia has low reproductive health knowledge,<sup>13,14</sup> and may face unique obstacles to contraception access.<sup>15</sup> Barriers to rural adolescents include distance to healthcare providers, limited access to certain contraceptives such as intrauterine devices and implants, and variability of sex education curriculum presented at school.<sup>13,15</sup> Therefore, a technology-based sexual health tool that is tailored to this population to provide education and local resources, could have a significant impact on adolescent risk reduction. In order to develop a tool for this demographic, a pilot study was necessary among populations that could give feedback as to the acceptability, feasibility, and accuracy of the website prior to distribution among rural adolescents. The purpose of this study was to pilot a comprehensive sex education self-study website among undergraduate students and obstetrician gynecology residents. It was hypothesized that the website would be determined to be accurate, feasible, and acceptable among this pilot group.

## MATERIALS AND METHODS

The primary author has been actively involved in teaching reproductive health to rural adolescents in West Virginia since 2016.<sup>13,14,16</sup> Feedback and resources from other teaching

modalities such as telemedicine interventions and web-based tools were used to develop a website housing a comprehensive sex education self-study. This website, [www.marshallteentalk.org](http://www.marshallteentalk.org) contains a curriculum divided into 4 sections: (i) How My Body Works (anatomy, physiology, sexuality, and gender identity), (ii) Healthy Relationships, (iii) Birth Control, and (iv) Sexually Transmitted Infection Prevention. The curriculum was designed as a series of short videos lasting 2–4 minutes each, in a sequential fashion so that each video would build upon the user's knowledge. The curriculum was designed for a user to have the ability to log in to the website and start and stop the videos as needed. The entire curriculum was designed to be completed within 30 minutes. Videos were created by the primary author, a board-certified obstetrician-gynecologist with expertise in adolescent health, with the assistance of a web developing agency.

This was an initial pilot of this self-study website among a small group of physicians and young adults to assure medical accuracy, feasibility, and appeal. Obstetrics and Gynecology (OBGYN) resident physicians and freshmen undergraduates at Marshall University were asked to participate in the study. These populations were chosen for specific reasons. Marshall OBGYN resident physicians have expertise in reproductive health, including all topics covered within the curriculum, and work to educate others, including adolescents, on these topics. These resident physicians are able to formally verify the medical accuracy of the self-study tool and give feedback on how topics are presented. Marshall freshmen undergraduates were included as they offer the expertise of acceptability and feasibility of the website. This latter group are West Virginia residents and have recently completed high school, and therefore, it was expected that they could offer a valid opinion on the future use of this tool for younger high school students within West Virginia. Adolescents under the age of 18 were not included due to restrictions to parental consent and the early development of the website. This pilot among an older population is a necessary step in order to gain approval for the recruitment of adolescents for future use.

Participants were excluded if they were under 18 years of age or were non-English speaking. OBGYN resident physicians were recruited during scheduled didactic sessions, and freshman undergraduates were recruited from 2 freshman biology classes. Institutional Review Board approval was obtained, and all participants completed an informed consent. Participants were recruited during September and October of 2019.

Subjects were provided the website address and instructions. Each participant was required to create a login that would allow them to start and stop the curriculum as needed, and return to the website and view the material at any point without starting over. Once they created a login, they were prompted to complete a pre-test assessing their past experience with sex education curriculums. They were then prompted to complete the video curriculum. After viewing all of the videos within the curriculum, they were then asked to complete a post-test that asked them to

**Table 1.** Comparisons between Undergraduate and Resident Physician Subjects in regards to demographics, past experience with sex education, and preferred sources for sexual health

Subject characteristic	Undergraduate subjects (n = 14)	Physician subjects (n = 10)	P Value
Age, mean(SD)	19.6 (2.7)	30.4 (3.8)	<.001
Gender, n(%)			
Male	1 (7.1)	3 (30)	.14
Female	13 (92.9)	7 (70)	
Grade when sex education was taught. n(%)			
Elementary (grades K-5)	1 (7.1)	5 (55.6)	.03
Middle School (grades 6–8)	7 (50)	3 (33.3)	
High School (grades 9–12)	6 (42.9)	1 (11.1)	
Reported use of Internet search engine (ie:Google) to ask sexual health question. n(%)	14 (100)	9 (90)	.23
Reported use of YouTube to ask sexual health question. n(%)	6 (42.9)	3 (30)	.52
Preferred information source for sexual health. n(%)			
Family/Friends	4 (28.6)	1 (10)	.17
Internet	7 (50)	3 (30)	
Healthcare Provider	3 (21.4)	4 (40)	
Book/Magazine	0 (0)	2 (20)	

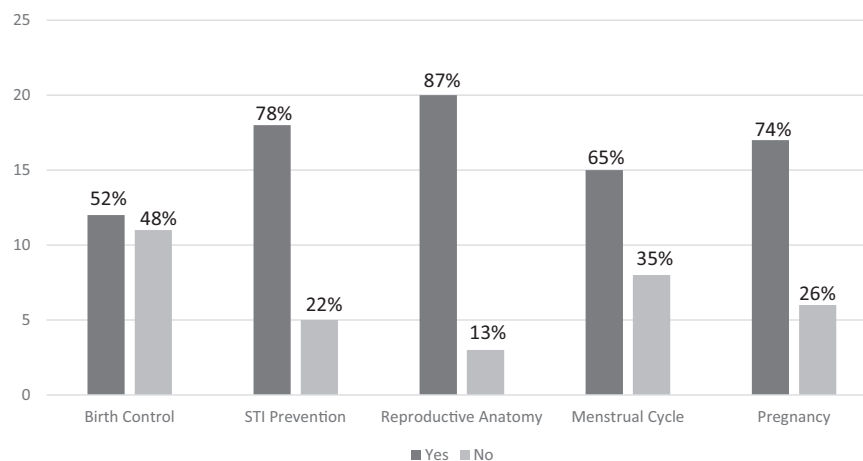
evaluate the website and video curriculum. Likert scale questions included asking the participant how accurate they felt the information was in each session, how easy the session was to follow, and overall how useful the information was. They were also asked whether they felt that the website would appeal to high school age students and whether this younger age group would be able to complete the self-study website. The pre-test and post-test were both embedded within the website, and when all tasks were complete, a certificate of completion was sent to the study team.

Data collected from the pre-test and post-test were collected with an online survey tool and stored in a secure database. OBGYN residents received a \$20 online gift card for participation. Freshmen undergraduate students were entered into a drawing for 1 of 5 Amazon tablets, and winners were notified via email. An incentive of a drawing was used for the undergraduates

due to the difficulty of arranging individual gift card distribution to participants on the undergraduate campus. Pre-test and post-test data were analyzed by descriptive statistics, and proportions between subject groups on demographic data, past experience with sex education, and preferred sources for sexual health were compared using Chi-square. Data were analyzed using SPSS vs 26 and *P* value of significance set at <0.05.

## RESULTS

24 subjects participated in the study (14 undergraduates and 10 physicians). The majority of the participants were female (83%), and the mean age of the physician group was older than the undergraduate group (*P* = .001). [Table 1](#) demonstrates differences in group age, gender, sex education background, use of the Internet for sexual health questions, and preferred sources



**Figure 1.** Number of subjects and percentages in both groups reporting topics covered by sex education. (N = 23 with prior sex education).

**Table 2.** Subject evaluation of each website session for medical accuracy, ease of use, and overall usefulness

Subject characteristic	Session 1: How My Body works (anatomy, physiology, sexuality, and gender identity)	Session 2: Healthy relationships	Session 3: Birth control	Session 4: Sexually transmitted infection prevention
How accurate was this session? n(%)				
Very Accurate	24 (100)	24 (100)	24 (100)	24 (100)
Somewhat Accurate	0 (0)	0 (0)	0 (0)	0 (0)
Not Accurate	0 (0)	0 (0)	0 (0)	0 (0)
How easy was it to follow along? n(%)				
Very Easy	21 (87.5)	22 (91.7)	22 (91.7)	21 (87.5)
Easy	3 (12.5)	2 (8.3)	2 (8.3)	3 (12.5)
Difficult	0	0 (0)	0 (0)	0
Very Difficult	0	0 (0)	0 (0)	0
How useful was this session? n(%)				
Very Useful	24 (100)	24 (100)	23 (95.8)	24 (100)
Somewhat Useful	0 (0)	0 (0)	1 (4.2)	0 (0)
No so useful	0 (0)	0 (0)	0 (0)	0 (0)
Not at all Useful	0 (0)	0 (0)	0 (0)	0 (0)

of information. All but 1 subject reported receiving some form of sex education in school, and the physician group had more subjects receiving sex education in elementary and middle school. 5 physician subjects reported sex education in 4th or 5th grade, 3 reported 6th grade, and one 9th grade. In the undergraduate group, 7 subjects (50%) reported 9th grade was the year they were taught sex education. Out of all subjects, 4 (16.6%) reported their sex education experience to be “High quality,” while

11 (45.8%) reported it to be “low quality,” and 8 (33.3%) were neutral. All 23 subjects reported their sex education was taught in a classroom setting; 4 (17.4%) were taught by an outside group; 18 (78.3%) by a teacher, and 1(4.3%) by a nurse and teacher. [Figure 1](#) demonstrates what topics the subjects reported being covered by their sex education experience. Most subjects reported receiving information on STI prevention (78.3%), anatomy (87%), the menstrual cycle (65%), and pregnancy (73.9%).

**Table 3.** Subject open-ended evaluation responses of the website self-study tool

What did you like about the website self-study?
• “It reduces the anxiety a student feels when having to take sex ed in a classroom.”
• “You address issues that could be considered ‘taboo’ regarding gender/sexuality, in a private, safe, familiar Internet format.”
• “People are able to watch on their own time and not be embarrassed when confused about certain things or topics that are shown.”
• “Accurate and thorough information that is easily accessible.”
• “That you can do this on your own. It’s awkward learning this stuff among peers.”
• “You can learn at your own pace.”
• “Easy to watch and comprehend. Good use of pictures and animations. Very relevant points.”
• “Short videos. Easy to navigate the site, and accurate information.”
What could be improved?
• “Teens could just play the videos and not fully grasp the concepts.”
• “Not as easy to ask questions as in-person training.”
• “Questions could be put in throughout the videos to make sure students are understanding.”
• “If you have a question, you can’t ask it right away.”
• “Vary the music choice throughout.”
• “More animations or different speakers.”
What could be added?
• “More information on each STI specifically and warning signs to look for.”
• “Adding a topic about the LGBT community wouldn’t be bad to have so people can learn more about that.”
• “STI stats and possible symptoms.”
• “If your partner wants to have sex but you don’t; ways to go about telling them no.”
• “More details about IUDs because people have ‘horror stories’ about them.”
• “Relationship and personal skills.”
• “Maybe a quick thing on what to expect when you see a doctor.”

However, only 12 (52.2%) subjects received information on specific birth control methods.

Subjects were asked about Internet use to ask personal sexual health questions. All but one subject (95.8%) reported the use of an Internet search engine (ie: Google) to ask a sexual health question. Of those, 17 (73.9%) felt that the information obtained was “somewhat accurate,” while 4 (17.4%) felt it was “very accurate.” Only 8 (33.3%) reported using YouTube videos to access sexual health information, with only 2 (25%) of these subjects reporting the information as “very accurate.” The Internet was the most common source of sexual health information for the undergraduate subjects, while healthcare providers were the most common source reported by the physician subjects (Table 1).

Table 2 demonstrates the assessment of each session on usefulness, accuracy, and how easy it was to follow. Overall individual website sessions were reported to be highly accurate, very easy to follow, and very useful. There were no differences in assessments by subject grouping. When asked if high school age subjects would be interested in the self-study website, 100% of subjects reported “Yes.” When asked if a high school student would be able to complete the self-study website, 100% of subjects also reported “Yes.” Subjects were asked how they felt about the addition to the website of an anonymous question and answer link, a list of confidential STI screening resources, and a link to local clinics. 23 (95.8%) felt these additions would be “very helpful.” One subject felt they were not necessary. Table 3 records the open ended feedback from both physician and undergraduate subjects on both positive aspects of the website and suggestions for improvement.

## DISCUSSION

This study demonstrates that among a group of physicians and college freshman, a self-study website was an accurate and appealing way to teach sex education. The study population reported an overall low-quality past experience with classroom-based sex education, and a large proportion of certain topics such as birth control methods were not taught. All 4 sessions were rated as very useful, easy to follow, and accurate, and the subjects felt the website would be acceptable for a younger high school population.

When responsible adults communicate about sexual health topics with adolescents, there is evidence of delayed sexual initiation and increased birth control and condom use. Many parents may talk with their adolescents about risks of sexual activity; however, a recent report showed that one-third to one-half of females aged 15–19 stated never having talked with a parent about contraception, STIs, or other sexual health matters.<sup>17</sup> Technology can help bridge this gap, as it allows for a broad reach at relatively low cost, greater privacy for adolescents to learn about sensitive topics, and increased capacity for individually tailoring material to specific populations.<sup>4</sup> This was

apparent in our study (Table 3), as several subjects noted that the website allowed more privacy and a better understanding of sensitive subjects that have the potential to be awkward in a classroom setting. Furthermore, 95.8% of the subjects had used an Internet search engine to look up information on sexual health. More importantly, the younger population of undergraduates were more likely to go to the Internet for sexual health information as opposed to other resources.

Limitations of this study include the small sample size and the pilot nature of the design with the subjectivity of feedback. Likert scale questions with 3 or 4 points may also limit the findings, as it lends to greater subjectivity of responses. Recall bias could also be a confounding factor for subjects answering questions about past sex education experience. The generalizability of the study findings may be limited due to the chosen sample, small size, and the limited number of male subjects. While 3 male physician subjects completed the study, only one male undergraduate student participated. Future studies should attempt to involve better gender representation. This small pilot also limited analysis as both group’s assessments of the program were evaluated together (Table 2). As mentioned, there were no differences in assessments by subject grouping. The chosen sample also has relatively high health literacy, given that these are undergraduate students and physicians. While the subjects felt that the material would be useful for younger high school subjects in West Virginia, it is possible that the website will not be appropriate for this younger age group. Despite these limitations, this pilot was necessary to ensure that moving forward, the website would portray accurate and easily comprehensive material. Current study is underway to test this website among a group of adolescents in urban and rural areas in West Virginia.

The American College of Obstetricians and Gynecologists describes the role of the OBGYN physician to support and assist sexuality education by developing evidence-based curricula that focus on clear health goals. Because of their knowledge, experience, and awareness of a community’s unique challenges, obstetrician-gynecologists can be an important resource for sexuality education programs.<sup>1</sup> OBGYN physicians are more and more utilizing technology as a platform to teach sexual health.<sup>18</sup> This website was developed by a board-certified OBGYN with expertise in adolescent healthcare and insight into the needs of adolescents within a specific geographic region of rural West Virginia. Policymakers should engage resources from the healthcare community and consider these alternative ways to teach sex education, such as through online learning, when classroom-based initiatives are lacking or sex education is not mandated.

As other studies have shown that sex education programs had more positive results when interventions included individualized tailoring,<sup>4</sup> such is the goal for the future use of this website. Future work currently underway includes updating the website based on feedback from this pilot study. This includes adding question and answer links, a link to the local clinic and

confidential STI testing, and changing the format to allow more interactive questions throughout each session. The website can then be incorporated as a resource within clinic settings, local after school programs, and school-based health programs that serve high school students. The website [www.marshallteentalk.org](http://www.marshallteentalk.org) was found to be overall useful, acceptable, feasible, and accurate in this pilot study among undergraduate students and resident physicians. This older demographic with higher health literacy felt that this website tool would be appropriate for high school students in West Virginia, yet the generalizability of these results to this younger population is limited. Future research involves testing this research tool among high school adolescents in urban and rural areas of West Virginia.

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## STATEMENT OF AUTHORSHIP

Jennie Yoost: Writing - Original Draft, Formal Analysis, Conceptualization, Methodology, Investigation, Resources, Writing - Review & Editing, Funding Acquisition, Project Administration; Morgan Ruley: Conceptualization, Methodology, Investigation, Resources, Writing - Review & Editing, Funding Acquisition; Levi Durfee: Conceptualization, Methodology, Investigation, Resources, Writing - Review & Editing, Funding Acquisition.

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