Annals of Nursing Research and Practice

Open Access

Austin Publishing Group

Research Article

Evaluating the Effectiveness of an Online Educational Intervention on Knowledge of Sexual Health and STDs/STIs Among College-Age Female Students

Hoffman JL[1]* and Scazzero JA[2]

[1]Department of Nursing, Eastern Michigan University, USA

[2]Department of Accounting & Finance, Eastern Michigan University, USA

***Corresponding author:** Jenni L Hoffman, Assistant Professor, Eastern Michigan University School of Nursing, 336 Marshall Building, Ypsilanti, MI 48197, USA

Received: August 08, 2016; **Accepted:** September 27, 2016; **Published:** September 29, 2016

Abstract

Sexually Transmitted Diseases (STDs)/Sexually Transmitted Infections (STIs) disproportionately affect women, adolescents and young adults. Left undiagnosed or untreated, these infections can damage internal organs and can cause long-term health problems, such as infertility or cancer. It is paramount to make sure that the education being offered to these individuals is helpful in increasing knowledge about sexual health and STDs/STIs. This study combines a mixed methods research approach to gain a better understanding of sexually active, young adult females with respect to their current knowledge about sexual health and STDs/STIs, and determine whether an online educational program is effective in improving their knowledge of sexual health and STDs/STIs.

Keywords: Sexual Health; Sexually Transmitted Diseases/Infections; Knowledge; College-Age Female Students; Online Educational Intervention

Abbreviations

STDs: Sexually Transmitted Diseases; STIs: Sexually Transmitted Infections; HIV: Human Immunodeficiency Virus; IRB: Institutional Review Board; NP: Nurse Practitioner; SPSS: Statistical Package for the Social Sciences; HPV: Human Papilloma Virus; HSV: Herpes Simplex Virus

Introduction

STDs/STIs disproportionately affect women, adolescents and young adults. Although 15-24 year olds represent approximately one-quarter of the sexually active population, they account for nearly half of all new STDs/STIs each year [1]. Many adolescent and young adult females are not aware that certain STDs/STIs are incurable or that certain STDs/STIs can be silent, without showing any signs or symptoms [2]. Also, many do not know that certain STDs/STIs can have serious consequences to their health; for example, if certain STDs/STIs are untreated, they can lead to damage of the internal organs and may cause long-term health problems, such as infertility or cancer [2]. Reducing the proportion of adolescent and young adult females with STDs/STIs is one objective of Healthy People 2020 [3]. The purpose of this mixed methods study was to gain a better understanding of sexually active, young adult females with respect to their current knowledge about sexual health and STDs/STIs, and determine whether an online educational program is effective in improving their knowledge of sexual health and STDs/STIs.

Research has shown that there is a knowledge deficit of sexual health and STDs/STIs among adolescent and young adult females and that the knowledge deficit is primarily of those non-Human Immunodeficiency Virus (HIV) STDs/STIs that are more common. The authors of a quantitative study in Philadelphia, Pennsylvania found that overall adolescent knowledge of STDs/STIs is nominal and that current STD/STI education may be overemphasizing HIV at the expense of other STDs/STIs for which adolescents are at a higher risk of contracting [4]. The authors of a secondary analysis from Carnegie Mellon University found that the knowledge deficit was of those non-HIV STDs/STIs that are more common and that diagnosis with an STD/STI was associated with an increase in knowledge about that STD/STI [5].

Studies have also shown that knowledge deficit of sexual health and STDs/STIs can lead to engaging in unsafe sexual practices which can lead to STD/STI transmission; whereas, education can lead to an increase in knowledge which can lead to a decrease in risky sexual behaviors, and ultimately a decrease in STD/STI incidence. The authors of a randomized controlled trial in Pittsburgh, Pennsylvania showed that an interactive video intervention led to an increase in knowledge, which was associated with abstinence, fewer condom failures and ultimately decreased STD/STI diagnoses [6]. The authors of a quantitative study in Tirana, Albania found a significant association between knowledge about STDs/STIs and consistent condom use, and provide support for knowledge acquisition as an important strength for healthy sexual behavior [7].

In addition, studies have found that there is a need to improve the effectiveness of sexual health and STD/STI education. The authors of a quantitative study from Ohio State University found that a computer-based intervention designed to influence variables related to pregnancy and STD/STI prevention was rated positively by participants and that those in the experimental group were less likely to begin sexual activity and had greater overall knowledge, greater condom negotiation self-efficacy, more positive attitudes toward delaying sexual activity, and a greater situational self-efficacy than in the control group [8]. The authors of a secondary analysis of the 2001 Minnesota Student Survey found that students with low perceived knowledge were less likely to be sexually experienced and that among sexually active students, those with low perceived knowledge also were more apt to engage in risky sexual behaviors [9].

Citation: Hoffman JL and Scazzero JA. Evaluating the Effectiveness of an Online Educational Intervention on Knowledge of Sexual Health and STDs/STIs Among College-Age Female Students. Ann Nurs Res Pract. 2016; 1(2): 1008.

Based on the literature, what is known about this topic is that knowledge deficit of sexual health and STDs/STIs can lead to engaging in unsafe sexual practices which, in turn, can lead to STD/STI transmission. Conversely, education can lead to a decrease in risky sexual behaviors and thus a decrease in the incidence of STDs/STIs. It is also known that the lack of knowledge is especially pronounced of non-HIV STDs/STIs, which are more common. In addition, it is known that there is a need to improve the effectiveness of educational interventions, and that healthcare providers play an important role. Finally, there is a need for additional research on this topic with this population. This study will help to fill the gaps in the literature by focusing on college-age female students.

Materials and Methods

Design

This study utilized a mixed methods design for a comprehensive approach and to strengthen the investigation. The quantitative component of this study was quasi-experimental design, specifically a one-group pretest-posttest design. The qualitative component was evaluatory and collected exploratory research.

Sample and setting

The sample for this study consisted of females who were currently or had been sexually active between 18 and 22 years of age at a Midwestern public university. The sample size was 335 participants. The sampling method utilized was convenience sampling.

Ethical considerations/human subjects concerns

Permission to conduct this study was obtained from the Human Subjects Review Committee/Institutional Review Board (IRB) at the university.

Measurement/instrumentation

Questionnaires were administered to participants which assessed sociodemographic characteristics and knowledge about sexual health and STDs/STIs. The quantitative content questions were presented in both the pretest and posttest; the qualitative questions appeared only in the posttest.

Study tool items were independently developed. Face validity was ascertained by a group of subject peers prior to the previously conducted pilot study (n=36). Content validity was established by Nurse Practitioner (NP) experts in the field. Regarding reliability, the results of this study (n=335) had similar results to the pilot study.

Data collection procedures

Data was collected during an academic semester, surveying undergraduate students across various departments of the university, via an online survey (Survey Monkey). After obtaining approval from the IRB, an e-mail script with a link to the survey was sent to undergraduate students at the university. The e-mail script consisted of an introduction and description of the study, and an invitation for those who met the criteria to participate. The survey link contained in the e-mail first took participants to a consent form and subjects had to agree to terms prior to beginning the study. If subjects agreed to terms, they were taken to the pretest but if they did not agree to terms, they were exited from the survey. The first three questions in the pretest were demographic, qualifier questions to make sure participants met the inclusion criteria of being females, who were currently or had been sexually active, and between the ages of 18 to 22 years. If students responded they were male or were not currently or had not been sexually active, they were disqualified and exited from the survey. Once participants finished the demographic questions, they then completed the content questions in the pretest. Once participants completed the pretest, they entered the online educational intervention that contained facts about sexual health and STDs/STIs, which was expected to take them approximately 15 minutes. The intervention, which was part of the online survey as text, went over which STDs/STIs are incurable, can lead to infertility if left untreated, and can cause cancer. It also went over which routes are considered "sex," which routes can result in STD/STI transmission and which routes one should use a condom with. Additionally, the intervention covered whether one could get an STD/STI even if they use a condom, whether one may have an STD/STI without signs or symptoms, and whether teenage girls and young women are more susceptible to getting STDs/STIs than older women and men. Finally, the intervention covered prevention and resources for more information. Once participants completed the educational intervention, they were taken to the posttest. The structure of the posttest contained the same questions as they appeared in the pretest (with the exception of the demographic questions at the beginning of the pretest), followed by the open-ended questions. The qualitative questions assessed what things they learned that they did not know before about STDs/STIs, their own sexual health, disease/infection prevention and their own risks to STDs/STIs. The qualitative questions also assessed what information they found most and least helpful and what additional areas about sexual health and STDs/STIs they feel needs more explanation. Upon completion of the study, participants were invited to provide their e-mail address if they were interested in receiving a $5.00 Subway® electronic gift card, which was a study incentive. Total participation time was estimated to be between 30-45 minutes.

Analysis

Quantitative data was analyzed using the computer software program Statistical Package for the Social Sciences (SPSS). Qualitative data underwent content analysis.

Results and Discussion

Results

Quantitative data: The participants consisted of 335 females at a Midwestern public university who were or had previously been sexually active. Their ages were fairly evenly distributed from 18 to 22 years. They were asked a number of questions regarding sexual health and STDs/STIs. A paired t-test was conducted on the total number of correct quantitative pretest and posttest questions related to sexual health and STDs/STIs as an indicator of the overall effectiveness of the educational intervention. The difference in the total number correct between pretest and posttest was calculated for each student. The mean number of questions answered correctly on the posttest was significantly greater than the mean number of questions answered correctly on the pretest (t=8.01, p=0.000) (Table 1).

A McNemar test, which is based on the binomial distribution, was applied to each individual question to determine the knowledge

Table 1: Summary of Correct Answers Out of 30 Questions- Pre and Post Intervention.

Pre Mean	Post Mean	Difference	Std. Error Mean	t	df	p-value
20.88	23.27	2.39	0.298	8.01	233	0.000*

*Significant at α= 0.01

Table 2: Responses to Diseases That Are Not Curable- Pre and Post Intervention.

Disease	Incorrect/Don't Know to Correct	Correct to Incorrect/Don't Know	No Change	p-value
Chlamydia	48	21	184	0.001*
Gonorrhea	56	14	183	0.000*
Trichomoniasis	56	20	177	0.000*
Human Papilloma Virus/Genital Warts	82	13	158	0.000*
Herpes Simplex Virus/Genital Herpes	68	10	175	0.000*
Syphilis	51	22	180	0.001*

*Significant at α= 0.01

Table 3: Responses to Diseases That Can Lead to Infertility If Untreated- Pre and Post Intervention.

Disease	Incorrect/Don't Know to Correct	Correct to Incorrect/Don't Know	No Change	p-value
Chlamydia	51	14	183	0.000*
Gonorrhea	54	18	176	0.000*
Trichomoniasis	75	19	154	0.000*
Human Papilloma Virus/Genital Warts	48	26	174	0.007*
Herpes Simplex Virus/Genital Herpes	45	27	176	0.022**
Syphilis	59	17	172	0.000*

*Significant at α= 0.01
**Significant at α= 0.05

Table 4: Responses to Disease That Can Cause Cancer- Pre and Post Intervention.

Disease	Incorrect/Don't Know to Correct	Correct to Incorrect/Don't Know	No Change	p-value
Chlamydia	45	29	169	0.041**
Gonorrhea	46	28	169	0.024**
Trichomoniasis	38	33	172	0.318
Human Papilloma Virus/Genital Warts	47	18	178	0.000*
Herpes Simplex Virus/Genital Herpes	45	33	165	0.107
Syphilis	50	30	163	0.017**

*Significant at α= 0.01
**Significant at α= 0.05

Table 5: Responses to Routes That Are Considered Sex- Pre and Post Intervention.

Route	Incorrect/Don't Know to Correct	Correct to Incorrect/Don't Know	No Change	p-value
Oral	23	3	219	0.000*
Vaginal	0	2	243	1.0
Anal	16	3	226	0.002*

*Significant at α= 0.01

area that was significantly affected by the intervention. The individual questions addressed the curability, infertility, and cancer causing properties of the following non-HIV STDs/STIs: chlamydia, gonorrhea, trichomoniasis, Human Papilloma Virus (HPV), Herpes Simplex Virus (HSV), and syphilis. For each non-HIV STD/STI, Tables 2 and 3 show that the intervention significantly increased student knowledge concerning which are not curable and which can lead to infertility. Except for trichomoniasis and HSV, the intervention significantly increased student knowledge concerning which non-HIV STD/STI can cause cancer (Table 4).

Concerning the question of which routes are considered to be "sex," almost all participants were able to identify that sex is considered to be vaginal on the pretest; however, the intervention significantly increased the proportion of students that were able to identify that sex is also considered to be oral and anal (Table 5). In reply to the pretest question of which routes can result in STDs/STIs, almost all participants were able to identify that the vaginal, oral, and anal routes can result in STDs/STIs. Regarding the question of which routes one should use condoms with, all participants were able to identify that condoms should be used with the vaginal route on the pretest. The intervention was effective in significantly increasing the proportion that were able to identify that condoms should be used with the oral and anal routes (Table 6).

Significant intervention effects were found for the question of

Table 6: Responses to Routes That One Should Use Condoms With- Pre and Post Intervention.

Route	Incorrect/Don't Know to Correct	Correct to Incorrect/Don't Know	No Change	p-value
Oral	55	0	188	0.000*
Vaginal	0	0	243	1.0
Anal	15	2	226	0.001*

* Significant at α= 0.01

Table 7: Responses to Remaining Questions- Pre and Post Intervention (Whether One Can Get an STD/STI With a Condom/Whether One Could Have an STD/STI Without Signs/Symptoms/Whether Young Women Are More Susceptible to Getting STDs/STIs Than Older Women and Men).

Question	Incorrect/Don't Know to Correct	Correct to Incorrect/Don't Know	No Change	p-value
One Could Get an STD With a Condom	21	0	222	0.000*
One Could Have an STD Without Signs/Symptoms	1	1	242	0.75
Young Women Are More Susceptible to Getting STDs/STIs Than Older Women and Men	96	5	141	0.000*

*Significant at α= 0.01

Table 8: Percent Correct Responses on Pretest Non-HIV STDs/STIs.

Not Curable (n=329)			Can Lead to Infertility If Untreated (n= 326)				Can Cause Cancer (n=317)
HPV	HSV	Both	Chlamydia	Gonorrhea	Trichomoniasis	All	HPV
50.2	58.1	46.5	63.2	59.8	44.5	39.9	51.7

Table 9: Percent Correct Responses on Pretest Routes.

Routes Considered "Sex" (n=319)			Routes of STD Transmission (n=316)			Routes of Condom Usage (n=318)		
Oral	Vaginal	Anal	Oral	Vaginal	Anal	Oral	Vaginal	Anal
89.3	99.1	91.8	96.2	98.4	95.6	65.1	99.4	90.6

whether one could acquire an STD/STI even if a condom is used and for the question of whether teenage girls and young women are more susceptible to getting STDs/STIs than older women and men (Table 7). The percentage that correctly answered the latter question increased from 52% on the pretest to 89% on the posttest.

In response to the pretest question of which non-HIV STDs/STIs are not curable, about half of the participants correctly identified HPV as incurable compared with 58% for HSV. Only 47% correctly identified both as incurable. A phi coefficient, which for a 2x2 contingency table is equivalent to the Pearson product moment correlation coefficient, indicated a significant positive association between the correctness of responses for these two items. Regarding the pretest question of which STDs/STIs if left untreated can lead to infertility, approximately 60% of participants were able to identify that chlamydia and gonorrhea if left untreated can lead to infertility compared to 45% for trichomoniasis. There was also a significant positive association between the correctness of responses for the questions that chlamydia, gonorrhea, and trichomoniasis if left untreated can lead to infertility. Pertaining to the pretest question of which STD/STI can cause cancer, slightly more than half of the participants correctly identified that HPV can cause cancer (Table 8).

Concerning the pretest question of which routes are considered to be "sex," approximately 90% correctly identified oral and anal routes. Referring to the pretest question of which routes can result in STD/STI transmission, approximately 95% correctly indicated that STDs/STIs can be acquired via the oral and anal routes. In response to the pretest question of which routes one should use condoms with, only 65% of participants identified that condoms should be used with the oral route (Table 9).

Qualitative: In response to the question of what was learned from the educational intervention about STDs/STIs, one's own sexual health, disease/infection prevention, and one's own risks to STDs/STIs, multiple themes were noted: risk, transmission, consequences, prevention, additional information, and awareness. With regards to risk, participants indicated introspection as evidenced by statements such as, "I'm not as safe as I presumed," "I am not too informed about sexual health," "It's possible to have an STD without showing symptoms and I feel more inclined to have a screening done," and "That I may not have been as informed as I originally thought." Also, regarding risk, participants indicated STD/STI susceptibility, e.g., "I'm more likely to get an STI because of my gender and age," "I did not know that young women (my age!!!) are more susceptible to getting an STI," and "If I have a partner and they tell me they don't have an STD/STI, they may not know because these diseases/infections don't always have signs or symptoms; therefore, I must be extra cautious." Another participant stated, "Just because you don't think something is wrong doesn't mean everything is okay." With regards to transmission, participants indicated learning routes considered to be sex, e.g., "Oral and anal are considered sex, and you can become infected all three ways." Also, regarding transmission, participants indicated learning routes that can result in STDs/STIs, e.g., "You can get an STD or STI through anal or oral sex," and "Not using a condom during oral sex can be just as dangerous as not using one during vaginal intercourse." With regards to consequences, participants indicated learning about curability of STDs/STIs, e.g., "I had no idea that some STDs and STIs could stay with you forever." Also, regarding consequences, participants indicated learning about HPV and cancer, e.g., "That it may cause throat cancer." In addition, pertaining to consequences, participants indicated learning about STDs/STIs and infertility, e.g., "I can lose fertility from not treating or curing STDs/STIs." Another participant stated, "Infertility and cancer is a real result of STIs!" With regards to prevention,

participants indicated learning about correct condom usage, e.g., "I should use a condom when giving a blow job," and "I learned that condoms should be used during oral, anal, and vaginal intercourse." Also, regarding prevention, participants indicated learning about abstinence and safer sex, e.g., "Abstinence is the best way to prevent STDs and STIs," and "Condoms are good but abstinence is best." Finally, participants learned what measures they can take, e.g., "I now know that I should get vaccinated and also start getting Pap smears when I turn 21," and "I should be using condoms and not rely only on birth control." With regards to additional information, participants indicated learning more specific information about STDs/STIs, e.g., "I learned more specific information about the individual diseases," "Did not know about trichomoniasis," "I know the names, but I did not know much at all about them," "I often forget that trichomoniasis is an STD because it is not one that is commonly heard about." With regards to awareness, certain participants expressed affirmation that they are taking the necessary steps to protect themselves, e.g., "I am doing the right thing by using condoms and birth control. It's not overprotective!," "I am sexually active, so of course I am at some sort of a risk. However, I am being as close to safe as possible," "I will be more educated and organized on this topic here on out." Certain participants indicated awareness through related experience, e.g., "I am/was at high risk and now I have a STD, HPV," and "I have had an STI scare and work very hard to prevent getting one."

Referring to the question of what was most helpful from the educational intervention, multiple themes were noted: all information, additional information, risk, transmission, consequences, and prevention. The most common theme for this question was all information in which participants frequently made comments of the following nature, "Everything!," "I found all information helpful. This made me want to protect myself even more than what I'm doing to protect myself now," "I found all of the information to be helpful today. Although I have only had sex with my ex-boyfriend who was a virgin before me, this information is good to know in the future," "The whole thing is important for everyone to know since the sex education in this country is not up to par." Additional participants noted, "I like that I took the quiz then got to read the answers and retake the quiz. I feel like I remembered most to all of the information which will be helpful later on," and "If anything, it prompts me to get tested because that's the only way of truly knowing what I may or may not have. It's something you learn: 'Get tested because you might not even know' but reading this makes it more real. I also found it helpful knowing that I am more susceptible to STDs and STIs and I'm less likely to show signs for many of them. And having this survey in general is a wake-up." Another participant stated, "It was good to get a refresher on all of the information." With regards to additional information, participants indicated finding most helpful learning detailed information and statistics, e.g., "Finding out the statistics about STIs," "The information about specific STDs and STIs," and "More information about the severity of STDs and STIs." Also regarding additional information, participants indicated that learning about resources was most helpful, e.g., "Where to find information on the topics brought up by the survey, like the University's Health Center and Planned Parenthood, and the importance of getting screened for STIs and cancer," "The locations of places to get tested," and "I screenshotted the phone numbers of the resources which may come in handy later." With regards to risk, participants indicated finding most helpful learning about STI susceptibility, e.g., "That young women are more at risk for STDs. I had no idea," "You can have a disease even if you don't know it," and "That you can still catch a disease with a condom." With regards to transmission, participants indicated finding most helpful learning about STDs/STIs and oral and anal sex, e.g., "Knowing that you could get an STD from oral sex," "It's eye opening to see that it's equally important to stay safe during oral sex as it is for vaginal and anal. I knew that it could be transmitted through oral sex, but it's a nice reminder to stay safe :)," and "Anal and oral sex can still lead to STDs/STIs." With regards to consequences, participants indicated finding most helpful learning about serious consequences of STDs/STIs, e.g., "HPV can cause cancer," and "STDs/STIs can lead to infertility." Regarding prevention, participants indicated finding most helpful learning about general prevention strategies including the HPV vaccine, e.g., "I found the preventative tips to be most helpful," and "I received the Gardasil vaccine a couple years ago and I now understand why it was so important for me to do so."

In response to the question of what was least helpful from the educational intervention, the following themes were noted: all information helpful, transmission, consequences, and prevention. The most common theme for this question was all information helpful in which participants frequently made comments such as, "I thought all of it was useful!," "I think it is all great knowledge to have. Any (true) knowledge about sexual health whether you are sexually active or not is always a good thing to have," "All of the information given was very helpful. It made me want to think before having sex," "I think it was all beneficial to learn about," "It is all helpful. Nothing about sex ed is unhelpful," and "It was all very important." With regards to transmission, in reply to what was least helpful, participants indicated routes of STD/STI transmission, e.g., "I already knew what type of sex was considered sex and that you should use condoms for all of them. I just think its gross using one for oral sex." With regards to consequences, in reply to what was least helpful, participants indicated impact, e.g., "Information about specific STDs. I am in a committed relationship and find it highly unlikely that these will have an impact on my life. I do think that information is helpful for people in general to know, however." With regards to prevention, in reply to what was least helpful, participants indicated information on condom use, e.g., "Condom usage."

Referring to the question of what additional areas about sexual health and STDs/STIs participants wanted more explanation or information on, the following themes were noted: no additional information desired, additional STD/STI details, and prevention. With regards to the theme no additional information desired, in reply to what participants wanted more explanation or information on, most participants indicated nothing further needed, e.g., "Nothing-I just think it's good for everyone to know about sex and diseases and infections. Many people are misinformed about sex and infections and that's dangerous for not only themselves, but for those they are sexually active with," "I think you did a good job," "With the school system in general, I feel that the costs of STDs/STIs (what it does to your body, what treatments are available, if any, etc.) need to be explained more. With this survey, everything was well explained," "All the explanations were very informative," and "Everything was clear and concise." With regards to additional STD/STI details, in

reply to what participants wanted more information on, participants indicated wanting even more information on symptoms, treatment, and resources, e.g., "Where one can go to get tested for free or a low cost because we're in college and have dues so we can't pay a doctor $100 to test us for an STD/STI." Also, regarding additional STD/STI details, participants indicated a desire for information on other STDs like pubic lice and other infections like urinary tract infections and yeast infections. With regards to prevention, in reply to what participants wanted more information on, participants indicated pregnancy prevention, e.g., "Various forms of birth control."

Discussion

Quantitative: The percentage of correct answers increased from the pretest to the posttest questions, indicating additional knowledge, and thus showing the educational intervention was effective. This improvement supports the inclusion of those items from the educational intervention into existing sexual health and STD/STI education.

Since slightly less than one-half identified both HPV and HSV as non-HIV STDs/STIs that are not curable, an area for educational improvement could be more emphasis on HPV as well as HSV. The fact that participants during the pretest were more able to identify chlamydia and gonorrhea and less able to identify trichomoniasis in comparison, as STDs/STIs that if left untreated can lead to infertility, may point to participants receiving even less information on trichomoniasis than on chlamydia and gonorrhea with respect to infertility. This highlights that an area for improvement can include more education on trichomoniasis in addition to chlamydia and gonorrhea. The fact that on the pretest only slightly more than half of participants were able to identify that HPV can cause cancer was surprising given the media coverage on HPV, cervical cancer, and the HPV vaccine, yet points to there still being a need to increase this awareness further.

In the pretest, fewer participants considered the oral and anal routes to be sex as much as they considered the vaginal route to be sex. Also, in the pretest, fewer participants considered oral and anal as routes of STD/STI transmission, compared to the vaginal route. Additionally, in the pretest, fewer participants thought condoms needed to be used with the oral and anal routes compared to the vaginal route and this was especially significant with regards to the oral route. There is an association between what routes participants considered sex and what routes could result in STD/STI transmission, and routes of condom usage. Not all participants considered oral and anal to be sex, yet more recognized oral and anal as routes of STD/STI transmission, pointing to a possible disconnect (how can an STD/STI be acquired from a route that is not considered to be sex?). Not all participants felt condoms needed to be used with oral and anal routes, yet more recognized oral and anal as routes of STD/STI transmission, pointing to another possible disconnect (if it's a route of transmission, then why shouldn't a condom be used with that route?). The association in the pretest between those participants who thought condoms should be used with oral and anal sex, in comparison to vaginal sex, may indicate that many participants did not think condoms needed to be used with oral and anal sex as much as with vaginal sex. The association in the pretest between those participants who thought STDs/STIs could result from oral and anal sex and that condoms should be used with oral and anal sex, may indicate that many participants viewed oral and anal as routes of transmission yet did not feel condoms needed to be used with those routes. Therefore, this demonstrates the importance of emphasizing that oral, vaginal and anal routes are all considered to be sex, can result in transmission of STDs/STIs, and that condoms need to be used with each route.

Qualitative: When comparing the qualitative question responses to the quantitative data, it is apparent that a difference exists between what the participants think they know and what they actually know. For example, certain participants indicated that they knew sex is considered to be oral, yet indicated that they did not know that STDs/STIs could be transmitted orally or that condoms needed to be used with oral sex. Another example is that certain participants indicated that they already knew about using condoms as safer sex, yet indicated that they learned to use a condom for every type of sex.

It was surprising that despite media attention targeted at HPV and the HPV vaccine, still many participants did not know that HPV could cause cancer nor did they know about the HPV vaccine. It was also interesting, that considering participants' knowledge of the incurable non-HIV STDs/STIs HPV and HSV, though quantitative results indicated they knew less about HPV, qualitative results indicated desire for more information about HPV.

Examining the comments made in the qualitative section reveal important insight and cues. For example, in reply to the question asking what was learned from the educational intervention in regards to STDs/STIs, one's own sexual health, disease/infection prevention, and one's own risks to STDs/STIs, one of the participants responded, "I'm more likely to get an STI because of my gender and age." This is important because it shows the level of learning that has taken place, in that not only could the participant state what she learned, but she could also apply it to herself. Another example is the following statement from a participant, "It's possible to have an STD without showing symptoms and I feel more inclined to have a screening done." This indicates introspection has occurred as a result of this educational intervention, and that she may be more likely to actually implement health-promoting behaviors now as a result of this intervention. An additional example is in the following statement from a participant, "Condoms are good but abstinence is best." This not only indicates knowledge of risk even with condom usage and that abstinence is most effective but even more so, indicates and provides support for, balanced sexual health and STD/STI education. Finally, a participant responded, "I have had an STI scare and work very hard to prevent getting one," and "I am/was at high risk and now have a STD, HPV." This points to the importance of reaching individuals before they become sexually active, so that it is not through experience and consequences that they learn this information, but rather through anticipatory guidance and health promotion education, specifically sexual health and STD/STI education.

In reply to the question asking what was most helpful from the educational intervention, one of the participants responded, "The whole thing is important for everyone to know since the sex education in this country is not up to par." This comment is significant because it points to there being a need for this information and an area for improvement in sexual health and STD/STI education for health education teachers in the schools and healthcare providers in the

clinics alike. Specifically, from the clinical standpoint, healthcare providers can do a better job of anticipatory guidance and health promotion education with patients, i.e. not only face-to-face during wellness visits but also emphasized and further substantiated in the form of handouts provided to patients at those visits. Other participants responded, "The possible things that could happen," and "More information about severity of STDs and STIs." This is important because even though most participants by the posttest were able to correctly identify the STDs/STIs that if left untreated could lead to infertility and the STD/STI that could cause cancer, even for those who couldn't remember exactly what each of them were, they at least knew that some STDs/STIs could lead to infertility and cancer. This indicates the educational intervention was successful in conveying and emphasizing that STDs/STIs can have serious consequences. Another participant responded, "Finding out the statistics about STIs." This points to the importance of and desire for including this information, possibly because using this type of language drives it home more. Finally, various participants commented specifically on the intervention, e.g., "The facts after the first round of questions," "I found the information after the pretest very helpful," "I liked that I took the quiz then got to read the answers and retake the quiz. I feel like I remembered most to all of the information which will be helpful later on," "The knowledge on the subject matter," and "It was a nice quick education." This indicates that the format, content, and length of this educational intervention was successful and can have positive implications to being used in the future.

Study Limitations

There were potential limitations to this study. One such limitation is convenience sampling; however, undergraduate students of different backgrounds across different departments of the university were sampled in an attempt to control for biases and improve the representativeness of the sample. Another limitation is reliance on self-reports. Since they were self-reporting via online survey, they could have potentially given incorrect information. Though an incentive was offered to each participant to encourage and show appreciation for participation, it could have resulted in participants rushing through the study in an effort to collect the incentive which could influence the accuracy of results.

Implications

This study has the following implications. NPs and other healthcare providers need to keep in mind the goal of not only treating their patients, but teaching them fully about their risks and appropriate self-care and risk avoidance measures that they can incorporate, in an effort to more effectively care for themselves and reduce their risk of STD/STI transmission. They need to focus their practice largely on health promotion education, especially with this population.

NPs and other healthcare providers should incorporate sexual health and STD education into clinical practice [10]. Sexual health and STD/STI education needs to start before adolescent and young adult patients become sexually active, e.g., beginning such education when patients are about middle school age and present for wellness visits. Proactive conversations counseling on responsible sexual behavior should start prior to sexual debut and continue throughout adolescence [11]. This education should be comprehensive and balanced, and include information about all STDs/STIs. It is important that adolescents and young adults know basic facts about each of them. Adolescent and young adult females need to be informed that not all STDs/STIs are curable and that many STDs/STIs are asymptomatic and if left untreated, can have serious consequences to their health. They also need to be informed that STDs/STIs can be spread with all forms of intercourse; therefore, condom use is imperative. Patients should be advised to use a new condom with each sex act, i.e. oral, vaginal and anal [2]. Research shows that balanced sexual health education that includes information about delaying intercourse and about contraception including condoms, can delay the onset of intercourse, reduce the frequency of intercourse, and decrease the number of sexual partners [12].

It is also important that educational materials, i.e. pamphlets and brochures, be age, gender, language, and culture appropriate. Written materials should be provided to substantiate that which is given during face-to-face discussions. Research shows that young people feel educational materials need to be developed with their target audience in mind, using language applicable to them [13].

Conclusion

The purpose of this mixed methods study was to gain a better understanding of sexually active, young adult females with respect to their current knowledge about sexual health and STDs/STIs, and determine whether an online educational program is effective in improving their knowledge of sexual health and STDs/STIs. Hopefully, this will assist with an increase in knowledge, utilization of health-promoting behaviors, a decrease in the incidence of STDs/STIs and their complications, and ultimately improvement in quality of life for this population. This research provides support for NPs and other healthcare providers to focus their practice largely on health promotion with this population, teaching them fully about their risks and appropriate self-care and risk avoidance measures to more effectively care for themselves and reduce their risk of STD/STI transmission. This study showed that this population has some, but not enough knowledge about this, and they need and want to acquire more knowledge, which is where NPs and other healthcare providers come into the picture. This is evidenced by the pretest and posttest scores (quantitative data) and the comments about what they've learned, found most helpful, and want additional explanation or information on (qualitative data). It is important to incorporate the information from this study into existing sexual health and STD/STI education to improve the effectiveness of education given to this population. Such improvements in education increase knowledge and may lead to an increase in health-promoting behaviors, and ultimately, a decrease in the incidence of STDs/STIs.

References

1. Centers for Disease Control and Prevention. Sexually Transmitted Diseases: Adolescents and Young Adults. 2015.
2. Centers for Disease Control and Prevention. CDC Fact Sheet: Information for Teens and Young Adults: Staying Healthy and Preventing STDs. 2015.
3. United States Department of Health and Human Services, Office of Disease Prevention and Health Promotion. Sexually Transmitted Diseases. 2016.
4. Clark LR, Jackson M, Allen-Taylor L. Adolescent Knowledge about Sexually Transmitted Diseases. Sexually Transmitted Diseases. 2002; 29: 436-443.

5. Downs JS, Bruine de Bruin W, Murray PJ, Fischhoff B. Specific STI Knowledge May Be Acquired Too Late. Journal of Adolescent Health. 2006; 38: 65-67.

6. Downs JS, Murray PJ, Bruine de Bruin W, Penrose J, Palmgren C, Fischhoff B. Interactive Video Behavioral Intervention to Reduce Adolescent Females' STD Risk: A Randomized Controlled Trial. Social Science & Medicine. 2004; 59: 1561-1572.

7. Burazeri G, Roshi E, Tavanxhi N. Does Knowledge About Sexually Transmitted Infections Increase the Likelihood of Consistent Condom Use? Preventive Medicine. 2004; 39: 1077-1079.

8. Roberto AJ, Zimmerman RS, Carlyle KE, Abner EL. A Computer-Based Approach to Preventing Pregnancy, STD, and HIV in Rural Adolescents. Journal of Health Communication. 2007; 12: 53-76.

9. Rock EM, Ireland M, Resnick MD. To Know That We Know What We Know: Perceived Knowledge and Adolescent Sexual Risk Behavior. Journal of Pediatric and Adolescent Gynecology. 2003; 16: 369-376.

10. Centers for Disease Control and Prevention. Sexually Transmitted Diseases Treatment Guidelines: Special Populations. 2015.

11. As-Sanie S, Gantt A, Rosenthal MS. Pregnancy Prevention in Adolescents. American Family Physician. 2004; 70: 1517-1524.

12. Planned Parenthood Federation of America. Sex Education in the U.S. 2012.

13. Kane R, Macdowell W, Wellings K. Providing Information for Young People in Sexual Health Clinics: Getting It Right. Journal of Family Planning and Reproductive Health Care. 2003; 29: 141-145.

Ann Nurs Res Pract - Volume 1 Issue 2 - 2016
ISSN: 2572-9403 | www.austinpublishinggroup.com

Citation: Hoffman JL and Scazzero JA. Evaluating the Effectiveness of an Online Educational Intervention on Knowledge of Sexual Health and STDs/STIs Among College-Age Female Students. Ann Nurs Res Pract. 2016; 1(2): 1008.