An Electronic Sexual Health Module for Hospitalized Adolescent Girls

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ABSTRACT

OBJECTIVES: To evaluate the acceptability and feasibility of an electronic sexual health module for inpatient adolescent girls and assess the preliminary effect on uptake of sexual health services.

METHODS: We recruited girls 14 to 18 years old admitted to the hospitalist service of 1 academic children’s hospital from January 2016 to October 2016. Participants completed an electronic sexual health module that included a sexual health assessment, tailored feedback (randomized for half of the participants only), and a questionnaire to request sexual health services. Participation and completion rates, along with effects of tailored feedback, risk perception, age group, and sexual activity on uptake of services, were examined.

RESULTS: Seventy-seven percent of eligible participants who were approached enrolled in the study (n = 66 of 86). The completion rate was 100%. Fifty-three percent (n = 35) requested some form of sexual health service; of these, 83% (n = 29) requested to watch a contraception video. There was no statistically significant difference in the frequency of requests for those who received tailored feedback and for those who did not (57% vs 48%; P = .48). Younger teens and those without sexual experience made requests similar to older and sexually experienced girls except regarding sexually transmitted infection testing, which was significantly higher in the latter populations.

CONCLUSIONS: This pilot study demonstrated reasonable feasibility and acceptability of a standardized sexual health module for adolescent girls admitted to the general pediatric wards. Videos focused on adolescent health were of particular interest to this population. Further study should examine the impact of such a module on long-term sexual health behaviors.

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880 RIESE et al

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Sexual health is critical in the care of adolescent girls in the United States. Sexually transmitted infections (STIs), specifically *Chlamydia* and gonorrhea, are disproportionately common among adolescent and young adult women and can lead to pelvic inflammatory disease and infertility. Because many STIs are asymptomatic, particularly for adolescent girls, the need for screening programs is critical. Unintended pregnancy is another major health risk for teens because it is associated with high school dropout, poor earning potential, and poverty. Additionally, teen pregnancies have more complications, and children born to teen mothers have an increased risk of developmental delay, poor school performance, and psychosocial problems. Although rates are declining, the United States still has 1 of the highest teen pregnancy rates among developed countries, which is attributed to inconsistent contraception use and selection of methods with lower effectiveness and reliability.

The majority of adolescents report no discussion of reproductive health during preventive health care visits. Furthermore, only one-third of primary care providers report screening asymptomatic adolescents, and <13% of teens have ever been tested for HIV. Adding to the problem, many older adolescents do not regularly see their providers for health maintenance and therefore are likely to enter the health care system only when urgent health care issues arise, often in emergency department and inpatient settings. However, a recent study showed that taking a sexual history is not the standard of care during adolescent inpatient admissions. In contrast, adolescents do report interest in sexual health information and services while they are admitted to the hospital, as demonstrated by Guss et al, who found that 37% of adolescent girls desired sexual health resources or services while admitted. The inpatient setting offers an opportunity to provide sexual health care for adolescent girls. New strategies that are both acceptable to adolescents and effective in engaging them are needed to address this gap in sexual health care services. Online interventions for adolescents using evidence-based behavior-change approaches, such as cognitive behavioral therapy, have been shown to have significant positive effects on reducing depression and anxiety symptoms. Theoretical approaches, such as the Transtheoretical Model (TTM), have been used extensively in behavior-change research, with adults and adolescents, and have demonstrated that tailoring behavioral intervention to the individual's readiness enhances the likelihood of sustained change. The TTM posits that behavior change is dynamic across 6 stages of readiness: precounseling, contemplation, preparation, action, maintenance, and termination.

We examined the use of an innovative electronic clinical module designed to conduct sexual health assessments, provide tailored electronic feedback, and allow requests for specific sexual health services for adolescent girls in the inpatient setting. Our primary aim was to develop a theory-based, interactive clinical module on sexual health and evaluate the acceptability (enrollment rate and interest in services) and feasibility (completion rate) of the sexual health module. Acceptability was also investigated by assessing whether the module, with and without an electronic feedback component, led to uptake of sexual health services. Secondly, we aimed to explore which sexual health services adolescents preferred and whether the presence or absence of module feedback, risk perception, age, and sexual activity were related to choice of services.

**METHODS**

**Study Setting and Recruitment**

From January 2016 to October 2016, we recruited adolescent girls admitted to the general pediatric service at a large, urban, academic children's hospital in the northeastern United States. The study was approved by the hospital institutional review board and registered at clinicaltrials.gov (identifier NCT03502226). A departmental pilot grant allowed for funding for 10 months.

Recruitment occurred during the week and on selected weekend days. Girls ages 14 to 18 years were recruited to focus the intervention on female reproductive health, reduction of female-specific sequelae of STIs, and contraception management. Eligibility screening was conducted by a research assistant (RA) after a review of the admission documentation in the medical record. To be eligible, girls needed to be admitted to the pediatric hospitalist service, be English speaking, and have an English-speaking parent or guardian present for consent. Participants were approached at any point during their inpatient admission, and recruitment was attempted multiple times if the patient or parent was not available at first attempt. We excluded wards of the state, participants with significant developmental delay or neurologic impairment, those who were not currently medically or psychologically stable, and those admitted for physical or sexual assault. Eligible participants assented, and parents and/or guardians provided written consent. Parents and participants who did not agree to participate were asked to voluntarily complete a short survey, which asked about demographics and reasons for declining (Supplemental Information).

Participants completed an electronic sexual health module that had been previously piloted with 10 participants and adjusted on the basis of their feedback. It included a sexual health assessment followed by sexual health service options (eg, STI testing and counseling) that could be requested electronically. Half of the participants were randomly assigned to electronically receive tailored feedback regarding their sexual risk behaviors before receiving sexual health service request options (assessment with feedback [AF]). The other half of participants received the sexual health service request options immediately after the assessment with no feedback (assessment only [AO]). Both the sexual health assessment and tailored feedback were based on the TTM of behavior change and codeveloped with psychologists at Pro-Change, a behavior-change technology company created by the founders of the TTM.
Randomization was computer generated and embedded within the module with age-matching to ensure distribution of age groups (14–15 and 16–18 years) across AF and AO. All participants were alerted that any requested services would be relayed confidentially to their physician team. The RA who enrolled participants and relayed requests to the medical team was blinded to randomization assignment. Participants received a $10 gift certificate to compensate for their time.

**Module Components**

**Sexual Health Assessment**

The initial module items elicited participants’ sexual behaviors and perception of their risk of unintended pregnancy and STIs and/or HIV. Items also assessed participants’ intention to use risk reduction or prevention methods immediately or in the future. These TTM-based items aimed to assess participants’ stage of readiness to engage in sexual health management (Supplemental Information).

**Tailored Feedback (for AF Participants)**

TTM-based feedback focused on condom use, contraception, and STI testing and provided education and encouragement about behaviors that participants might adopt or maintain. The delivery of messages depended on participants’ responses on the sexual health assessment about their sexual risks, report of interest in male versus female sexual partners, and intention to engage in prevention behaviors (see the Supplemental Information for example messages).

**Sexual Health Service Options**

The last portion of the module asked all participants if they would like to (1) request STI and/or HIV testing (urine and/or blood tests) during their hospitalization, (2) request a sexual health discussion with their hospital physician or primary care provider (who would be confidentially alerted), and/or (3) view an online video about contraception produced by the Nationwide Children’s Hospital Young Women’s Contraceptive Services Program. Participants were immediately able to watch the contraception video by clicking on the link and using the headphones provided. Other sexual health management requests were referred to the medical team by the RA. Medical decision-making was at the discretion of the participant’s medical team.

**Measures**

The primary outcome was feasibility and acceptability, which were assessed through recruitment statistics (eligibility, approach, participation or refusal, and completion rates). Reasons for refusal to participate in the study were collected. Uptake of services by participants was also considered a measure of module acceptability. Uptake was examined individually for each type of service offered as well as for a combined variable named “any uptake” for requests of at least 1 service. Reasons for not requesting each service were also collected. Additionally, RAs conducted chart reviews and verbal check-ins with the medical team for all participants who requested sexual health services to determine if any problems had arisen related to the requested sexual health services and confirm that the adolescent received the requested services.

The secondary outcome was as follows. We examined factors affecting uptake of services, including intervention condition and participant characteristics of risk perception, age category, and sexual activity status.

**Data Collection**

All components of the module were iPad based. The module was completed in the hospital room; parents and/or guardians were asked to leave, and the RA remained nearby in case the participant needed assistance. The sexual health assessment was collected via Pro-Change’s secure online software engine, TTMX. Requests for sexual health services were collected via Research Electronic Data Capture.21

**Analysis**

Data were analyzed by using Stata/SE (Stata Corp, College Station, TX).21 Counts and percentages were reported for acceptability and feasibility measures. The effects of feedback (AF versus AO), risk perception, age group, risk, and sexual activity (oral or vaginal) engagement on uptake of sexual health service were examined by using $\chi^2$ or Fisher’s exact tests. Analyses were performed for each individual service as well as for any uptake. We also compared the AF participants to AO participants to calculate the number needed to treat (ie, the number of adolescent girls who would have to receive the TTM-based feedback to have 1 more girl request at least 1 sexual health service).

**RESULTS**

**Participants and Acceptability and Feasibility**

Charts of 203 adolescent girls admitted to the hospitalist service during recruitment days were screened for eligibility. Sixteen percent ($n = 32$) were not approached because of discharge and/or transfer or limited time, and 42% ($n = 85$) were ineligible. Of the 88 girls who were approached, 77% ($n = 66$) agreed to participate (Fig 1). Of the 20 who declined participation, 16 adolescents, 3 parents, and 1 adolescent-parent dyad refused. The main reason for refusal was feeling too sick (57%; $n = 12$). None selected reproductive health–focused research as the reason for refusal. All enrolled participants completed the full study module.

**Participant Demographics and Sexual Health Risk**

Fifty-three percent of the girls were in the older age group (16–18 years old). The majority self-identified as non-Hispanic white (68%). Thirty-eight percent of participants were sexually active (any oral or vaginal intercourse), and 84% of these were in the older age group. Among all participants, 45% felt they had a chance of unintended pregnancy (either small, somewhat, or high chance), and 44% felt they had a chance of getting an STI. We found no significant differences in demographic characteristics between intervention groups (AF versus AO). Sexual activity was similar (40% vs 35%) in each group, although the AF group had nonsignificantly lower perceived risks of unintended pregnancy and STIs (Table 1).

**Uptake of Sexual Health Services**

Fifty-three percent of enrolled participants ($n = 35$) electronically requested some form of sexual health service. Of these, the contraception video was the most common...
request (83% \( n = 29 \)); 20% \( n = 7 \) of requests were to speak to a doctor about a sexual health topic, and 14% \( n = 5 \) were for STI testing. Participants cited not being sexually active and already being knowledgeable as reasons for not choosing services. These are summarized in Table 2.

Factors Affecting Uptake of Sexual Health Services

Fifty-seven percent of AF teens and 48% of AO teens requested at least 1 service. This difference was not statistically significant \( P = .48 \), nor were differences for the individual services requested (Fig 2). The number needed to treat for the tailored feedback was 9; that is, \(~9\) girls would have to receive tailored feedback to have 1 additional request for a sexual health service. Participants’ perceived risk was not associated with uptake of services. Older age and being sexually active were significantly associated with greater uptake of STI and/or HIV testing \( P = .03 \) and \( P = .003 \), respectively; however, uptake of the contraception video and discussion with the doctor were similar for either age group and for those who were and were not sexually active (Table 3).

Follow-through on Requests (Feasibility)

All participants who chose to watch the video were able to view it during the study (100% completion). Two participants did not have in-hospital sexual health discussions completed because of time constraints. All requests for STI testing were fulfilled. No other issues were reported by the medical team.

DISCUSSION

Our study examined a novel method to assess sexual history and offer education and sexual health services to hospitalized adolescent girls. We had a 77% participation rate for eligible participants and a 100% completion rate for enrolled participants. Other behavioral intervention studies with teens in medical settings have shown similar enrollment rates, ranging from 69% to 85%\(^23\)–\(^25\). Without additional time or effort from the medical team, all enrolled adolescent girls had comprehensive sexual histories elicited and were offered sexual health service options while in the hospital.

Completion of the sexual health assessment allowed for universal, standardized sexual-history taking, which has been shown not to occur consistently in the inpatient setting.\(^13\) In-person history taking may lack the level of detail that can be collected in the electronic format and may have the advantage of prompting real-time counseling by the provider. Nonetheless, adolescents have been shown to prefer the electronic format,\(^26\),\(^27\) particularly for sensitive topics such as sexual health.\(^28\),\(^29\)

Although at 53% uptake of services was not universal in this sample, it would not be reasonable to expect 100% because patient experiences and readiness differ. Still, the sexual health module led to a larger uptake of services than the percentage who reported a desire for more sexual health resources (37% of adolescent girls) in Guss et al’s\(^14\) study and certainly more than expected without any vehicle to promote sexual health questions. However, we did find that some participants were too sick and others felt adequately informed. It is possible that the use of the module may have broader effects beyond service uptake. For example, being empowered to request sexual health services

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**FIGURE 1** Recruitment flow diagram.

Adolescent girls admitted to hospitalist service from January 2016 to October 2016 and chart reviewed by RA

\[ n = 203 \]

Discharged and/or transferred before screening, \( n = 15 \)

Team felt not enough time, \( n = 17 \)

Excluded \( n = 85 \)

Parent and/or guardian unavailable (\( n = 27 \)) or non-English speaking (\( n = 11 \))

Unstable psychologically (\( n = 30 \)) or medically (\( n = 4 \))

Neurologic impairment, \( n = 6 \)

Physical or sexual abuse, \( n = 5 \)

Patient sleeping, \( n = 2 \)

Eligible and approached \( n = 86 \)

Refused \( n = 20 \)

Patient only, \( n = 16 \)

Parent only, \( n = 3 \)

Both patient and parent, \( n = 1 \)

Enrolled and randomly assigned \( n = 66 \)

Allocated and received control treatment \( n = 31 \)

Allocated and received intervention treatment \( n = 35 \)

Completed control treatment and analyzed \( n = 31 \)

Completed intervention treatment and analyzed \( n = 35 \)
confidentially in the hospital may heighten girls’ attention to and prioritization of sexual health, increase their likelihood of asking for future services, and improve safe sex behaviors. Repetition of this low-cost intervention with a larger sample may demonstrate valuable screening and educational and/or behavior-change benefits.

It is noteworthy that even those who had not yet engaged in sexual activity requested services, particularly viewing the contraception video and speaking with a doctor. This finding supports the value of a universal provision of sexual health services to and education for adolescents rather than targeting approaches at high-risk adolescents. Studies show that younger teens and those who are not sexually active are less likely to receive information about sexual health from providers, likely delaying their use of highly effective contraception at sexual debut. The contraception video was the most frequent request; it could be viewed independently without involvement of the hospital team. For that reason, it may have been considered the “safest” option for adolescents and also likely appealed to their technology-dependent lifestyle. However, it has been reported that the majority of heterosexual adolescents do not search for sexual health information online on their own. Guss et al’s study noted a pamphlet as the preferred method (tablet and/or video was not provided as an option) rather than discussion with a hospital physician or primary care provider.

The tailored, TTM-based feedback component of the module did not demonstrate a statistically significant impact on uptake of services. Firm conclusions cannot be drawn from this pilot study because the sample size was small and there was an imbalance in perceived risk between the 2 groups. However, our primary aim in this study was to assess the feasibility and acceptability of this sexual health module, and there were no observed deleterious effects of the feedback provided, and the incorporation of the feedback into the module was not time or effort intensive because it was automated. It is possible that the lack of observed influence of the feedback was because much of it focused on changing longer-term risk behaviors, such as carrying and using a condom; thus, the feedback did remind participants that they can talk to their hospital doctor at any time about each topic, they may have felt that the feedback adequately provided them

### TABLE 1 Participant Characteristics

<table>
<thead>
<tr>
<th>Characteristic</th>
<th>All Participants (N = 66, n (%))</th>
<th>AF Participants (n = 35, n (%))</th>
<th>AD Participants (n = 31, n (%))</th>
<th>P</th>
</tr>
</thead>
<tbody>
<tr>
<td>Age category, y</td>
<td></td>
<td></td>
<td></td>
<td>.78</td>
</tr>
<tr>
<td>14–15</td>
<td>31 (47)</td>
<td>17 (49)</td>
<td>14 (45)</td>
<td></td>
</tr>
<tr>
<td>16–18</td>
<td>35 (53)</td>
<td>18 (51)</td>
<td>17 (55)</td>
<td></td>
</tr>
<tr>
<td>Race and/or ethnicity</td>
<td></td>
<td></td>
<td></td>
<td>.69</td>
</tr>
<tr>
<td>Hispanic</td>
<td>13 (20)</td>
<td>9 (26)</td>
<td>4 (13)</td>
<td></td>
</tr>
<tr>
<td>Non-Hispanic white</td>
<td>45 (68)</td>
<td>22 (63)</td>
<td>23 (74)</td>
<td></td>
</tr>
<tr>
<td>Non-Hispanic black</td>
<td>3 (4.5)</td>
<td>2 (6)</td>
<td>1 (3)</td>
<td></td>
</tr>
<tr>
<td>Black and white selected</td>
<td>2 (3)</td>
<td>1 (3)</td>
<td>1 (3)</td>
<td></td>
</tr>
<tr>
<td>Asian American</td>
<td>2 (3)</td>
<td>1 (3)</td>
<td>1 (3)</td>
<td></td>
</tr>
<tr>
<td>American Indian</td>
<td>1 (1.5)</td>
<td>0 (0)</td>
<td>1 (3)</td>
<td></td>
</tr>
<tr>
<td>Sexually attracted to</td>
<td></td>
<td></td>
<td></td>
<td>.40</td>
</tr>
<tr>
<td>Girls only</td>
<td>1 (1.5)</td>
<td>0 (0)</td>
<td>1 (3)</td>
<td></td>
</tr>
<tr>
<td>Boys only</td>
<td>49 (74)</td>
<td>24 (69)</td>
<td>25 (81)</td>
<td></td>
</tr>
<tr>
<td>Both boys and girls</td>
<td>12 (18)</td>
<td>8 (23)</td>
<td>4 (13)</td>
<td></td>
</tr>
<tr>
<td>Unsure</td>
<td>4 (6)</td>
<td>3 (9)</td>
<td>1 (3)</td>
<td></td>
</tr>
<tr>
<td>Sexual risk behaviors</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Any oral or vaginal sexa</td>
<td>25 (38)</td>
<td>14 (40)</td>
<td>11 (35)</td>
<td>.71</td>
</tr>
<tr>
<td>≥1 lifetime sexual partner</td>
<td>12/17 (71)</td>
<td>7/9 (78)</td>
<td>5/8 (63)</td>
<td>.82</td>
</tr>
<tr>
<td>Sex while using drugs and/or alcohol</td>
<td>5/17 (29)</td>
<td>3/9 (33)</td>
<td>2/8 (25)</td>
<td>1.0</td>
</tr>
<tr>
<td>Risk perception</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Some risk, pregnancy</td>
<td>30 (45)</td>
<td>13 (37)</td>
<td>17 (55)</td>
<td>.15</td>
</tr>
<tr>
<td>Some risk, STI</td>
<td>29 (44)</td>
<td>12 (34)</td>
<td>17 (55)</td>
<td>.09</td>
</tr>
<tr>
<td>Some risk, HIV/AIDS</td>
<td>24 (36)</td>
<td>11 (31)</td>
<td>13 (42)</td>
<td>.38</td>
</tr>
</tbody>
</table>

* One participant also reported anal sex in addition to oral or vaginal sex.

### TABLE 2 Participant Reasons for Declining Sexual Health Services

<table>
<thead>
<tr>
<th>Reason for Declining Service</th>
<th>Participants, n (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Contraception video (n = 37)</td>
<td></td>
</tr>
<tr>
<td>Not sexually active</td>
<td>18 (48)</td>
</tr>
<tr>
<td>Already feel knowledgeable</td>
<td>6 (16)</td>
</tr>
<tr>
<td>Prefer another source</td>
<td>5 (14)</td>
</tr>
<tr>
<td>Not interested</td>
<td>4 (11)</td>
</tr>
<tr>
<td>Too sick to participate</td>
<td>4 (11)</td>
</tr>
<tr>
<td>Discussion with hospital doctor</td>
<td></td>
</tr>
<tr>
<td>(n = 59)</td>
<td></td>
</tr>
<tr>
<td>Not sexually active</td>
<td>19 (32)</td>
</tr>
<tr>
<td>Already talked with PCP</td>
<td>18 (30)</td>
</tr>
<tr>
<td>Already feel knowledgeable</td>
<td>13 (22)</td>
</tr>
<tr>
<td>Not interested</td>
<td>4 (7)</td>
</tr>
<tr>
<td>Not comfortable</td>
<td>3 (5)</td>
</tr>
<tr>
<td>Prefer another source</td>
<td>1 (2)</td>
</tr>
<tr>
<td>Too sick to participate</td>
<td>1 (2)</td>
</tr>
<tr>
<td>Discussion with PCP (n = 60)</td>
<td></td>
</tr>
<tr>
<td>Already talked with PCP</td>
<td>22 (37)</td>
</tr>
<tr>
<td>Not sexually active</td>
<td>18 (30)</td>
</tr>
<tr>
<td>Already feel knowledgeable</td>
<td>14 (23)</td>
</tr>
<tr>
<td>Not interested</td>
<td>5 (8)</td>
</tr>
<tr>
<td>Do not have a PCP</td>
<td>1 (2)</td>
</tr>
<tr>
<td>STI testing (n = 61)</td>
<td></td>
</tr>
<tr>
<td>Not sexually active</td>
<td>37 (61)</td>
</tr>
<tr>
<td>Do not feel at risk</td>
<td>14 (23)</td>
</tr>
<tr>
<td>Recently tested</td>
<td>6 (10)</td>
</tr>
<tr>
<td>Uncomfortable being tested</td>
<td>3 (5)</td>
</tr>
<tr>
<td>Prefer to be tested by PCP</td>
<td>1 (2)</td>
</tr>
</tbody>
</table>

PCP, primary care provider.
information, thus potentially reducing the likelihood of their requesting services. Finally, engaging in the assessment itself may have primed participants in both the AF and AO groups to think about sexual health, making the feedback less important when deciding to uptake services. These unanswered questions generate hypotheses for future research to continue the study of tailored, TTM-based feedback in improving point-of-care uptake of sexual health services and test the possible effects on longer-term behavior change, such as use of contraception.

One challenge of the technologically delivered intervention is the inability to nuance the feedback to allow for additional context for teens. For that reason, many of the messages specific to heterosexual sexual encounters were skipped for participants who reported same-sex partners; however, in real time, a more careful discussion could occur to ensure that important information is relayed without excluding or offending the patient. Although overall we noted positive feasibility and acceptability outcomes, there were some shortcomings. Key inpatient-specific barriers to engaging patients were lack of time and medical or psychological instability. Adolescent patients have dramatically shorter stays in inpatient units than they once did, and time during admission is commonly filled with medical team rounding and evaluation, medical studies and/or testing, and family visitation. This was demonstrated by the 2 participants who were discharged before the sexual health discussions with the team could occur. Still, brief interventions such as this can be completed in a short period of time and may facilitate the provision of adolescent-centered care, which improves patient satisfaction. Our sample did demonstrate that when teens are feeling unwell, they may not be open to engaging in other health-protective activities. Given that admission to the hospital occurs for many reasons, it is likely that some patients may feel well and receptive to sexual health information whereas others may not. Some research-specific barriers impacted participation. In particular, parents were required to be available to provide consent for research purposes, but in many states, laws protect adolescents’ rights to obtain confidential care regarding sexual health.

When parents were approached for this study, most were willing to have their children participate, and those who refused did not express reluctance for sexual health to be discussed as their reason. This finding suggests that a hospital protocol implementing a sexual health module is likely to be acceptable to families.

There are several important limitations to this study. First, participants in this small pilot study were recruited from a convenience sample at a single hospital site, which focused solely on female patients. Generalizability may be further limited because non–English-speaking participants, participants with developmental delays, and participants with non–English-speaking parents were excluded. Such groups should receive sexual-history screening and provision of sexual health care. We did provide compensation for participants, which could potentially interfere with true acceptability; however, no additional compensation was given for uptake of services. We did not track patients’ admission diagnoses, so that relationship to uptake of services cannot be evaluated. Despite randomization, risk perception was not equal between our AF and AO groups, which may have impacted our observed effect of the tailored feedback. Finally, because this was a small pilot study, we could not measure short- or long-term effects of module engagement (eg, sexual health service use and behavior change).

### CONCLUSIONS

This pilot study showed reasonable feasibility and acceptability of a sexual health module for adolescent girls admitted to a general pediatric ward. Although some inpatient-specific barriers were demonstrated, a “low-lift” intervention with minimal cost, effort, or time required such as this can create some standardization of history taking and allow for services to be offered systematically. Specifically, offering brief videos focused on adolescent sexual health may be the optimal option to pursue. To fully examine the impact of such interventions in this setting (educational videos, discussion

**TABLE 3** Association of Uptake of Services by Perceived Risk, Age Group, and Sexual History

<table>
<thead>
<tr>
<th></th>
<th>Any Uptake*</th>
<th>Watch Video</th>
<th>Talk to MD</th>
<th>Test for STIs</th>
</tr>
</thead>
<tbody>
<tr>
<td>All participants (W = 66)</td>
<td>55 (53)</td>
<td>29 (44)</td>
<td>7 (11)</td>
<td>5 (8)</td>
</tr>
<tr>
<td>No perceived risk (n = 25)</td>
<td>11 (44)</td>
<td>10 (40)</td>
<td>2 (8)</td>
<td>1 (4)</td>
</tr>
<tr>
<td>Some* perceived risk (n = 41)</td>
<td>24 (59)</td>
<td>19 (46)</td>
<td>5 (12)</td>
<td>4 (10)</td>
</tr>
<tr>
<td>14–15 y old (n = 31)</td>
<td>17 (55)</td>
<td>14 (45)</td>
<td>3 (10)</td>
<td>0 (0)</td>
</tr>
<tr>
<td>16–18 y old (n = 35)</td>
<td>14 (51)</td>
<td>15 (43)</td>
<td>4 (11)</td>
<td>5 (14)</td>
</tr>
<tr>
<td>No previous sex (n = 41)</td>
<td>22 (53)</td>
<td>19 (46)</td>
<td>4 (10)</td>
<td>0 (0)*</td>
</tr>
<tr>
<td>Any oral and/or vaginal sex (n = 25)</td>
<td>13 (52)</td>
<td>10 (40)</td>
<td>3 (12)</td>
<td>5 (20)*</td>
</tr>
</tbody>
</table>

* MD, medical doctor.

* Any uptake: participants made at least 1 service request.

* Some perceived risk: participants reported feeling they had at least “some chance” of unplanned pregnancy, STI, and/or HIV.

* $\chi^2$. P < .05.
with health care providers, as well as electronic, tailored feedback), longer-term follow-up assessments to gauge behavior changes would be useful.

REFERENCES


17. Prochaska JO, DiClemente CC, Norcross JC. In search of how people change. Applications to addictive behaviors. Am Psychol. 1992;47(9):1102–1114


20. Nationwide Children’s Hospital Young Women’s Contraceptive Services Program. Which birth control is right for me? Available at: https://www.nationwidechildrens.org/specilaities/bc4teens/resources/which-birth-control-is-right-for-me. Accessed September 13, 2019


22. StataCorp. Stata Statistical Software: Release 12. College Station, TX: StataCorp LP; 2011


26. Nguyen M, Bin YS, Campbell A. Comparing online and offline


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