Original Study

The Effect of Interprofessional Student-Led Reproductive Health Education on Youths in Juvenile Detention

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A B S T R A C T

Study Objective: To assess the effects of an interprofessional student-led comprehensive sexual education curriculum in improving the reproductive health literacy among at-risk youths in detention.

Design, Setting, and Participants: We performed a prospective cohort study involving 134 incarcerated youth and an interprofessional team of 23 medical, nursing, and social work students, who participated in a comprehensive reproductive health curriculum over the course of 3 days.

Interventions, and Main Outcome Measures: Basic reproductive health knowledge, confidence in condom use with a new partner, and self-efficacy with regard to contraception use and sexual autonomy were assessed before and after completion of the curriculum. We also assessed the student teachers’ level of comfort with teaching reproductive health to adolescents and their perception of interprofessionalism.

Results: Incarcerated youth showed a statistically significant increase in knowledge regarding sexually transmitted infections as well as self-reported confidence in condom use (P = .002). Self-efficacy in contraception use and sexual autonomy did not show significant improvement. Qualitative analysis of student teachers’ surveys revealed theme categories regarding perception of youth, perception of self in teaching youth, perception of interacting with youth, and perception of working in interprofessional teams.

Conclusions: Our program might represent a mutually beneficial community relationship to improve reproductive health literacy in this high-risk youth population.

Key Words: Incarcerated youth, Interprofessional education, Juvenile detention, Reproductive health education, Sex education

Introduction

Adolescent reproductive health is a critical public health issue in the United States, contributing to significant short- and long-term costs at the individual as well as societal level. More than half of all new sexually transmitted infections (STIs) occur in 15- to 24-year-olds. Unintended adolescent pregnancies are more likely to result in poor maternal and infant outcomes, and in Ohio alone, are estimated to cost over $393 million annually. A wealth of data identify incarcerated youth as a particularly high-risk group. Incarcerated youth have among the highest rates of STIs and are more likely to report associated high-risk behaviors such as higher number of sexual partners and alcohol or substance use during sex. In a survey of youth across 39 juvenile detention centers in the United States, 62% (total from 1801 questionnaires not reported by authors) of respondents reported being sexually active by age 12 years, and less than half reported using protection at the time of last intercourse.

Although the benefits of comprehensive adolescent sexual education are well established, significant regional variation and disparities exist in resource availability, resource allocation, and educator training. Even more limitations exist for incarcerated youth, whose access to expanded educational needs such as health curriculum is nonstandardized and often unmet. Because juvenile offenders comprise most of the out-of-school adolescent grouping, the incarceration period might therefore represent an opportune window for health and educational outreach.

The goal of our study was to assess the efficacy of an interprofessional student-led educational initiative in the Cuyahoga County Juvenile Detention Center (CCJDC), using a novel reproductive health curriculum. Our hypotheses were fourfold: (1) youths participating in the program would show a significant increase in their reproductive health knowledge with regard to STI transmission, contraception, navigation of safe relationships, and access to resources; (2) youths would have a statistically significant improvement in their self-reported confidence level of condom use, contraception use, and sexual autonomy; (3) student teachers would report increased comfort with teaching reproductive health to at-risk adolescents; and (4) student teachers would...
perceive interprofessionalism as a beneficial component of the program.

Materials and Methods

Curriculum Development

A novel curriculum focused on improving students’ basic reproductive health knowledge and health literacy was previously implemented in the Cleveland Metropolitan School District, with survey data showing significant knowledge retention at 4 months. We modified this curriculum with input from the CCJDC staff using the Family Life and Sexual Health curriculum and studies exploring effective population-specific implementation to provide greater emphasis on topics such as intimacy, assertiveness, and communication skills. We designed an interactive 3-day curriculum covering the following topics: reproductive anatomy, STIs, and contraception; communication skills; decision-making; and safe relationships. An interprofessional team of medical, nursing, and social work students from Case Western Reserve University (CWRU) was assigned to teach the curriculum within each CCJDC residential unit, with approximately 2–3 student teachers per group of 10 single-gender youths. At least 1 physician or advanced nurse practitioner from the Department of Obstetrics and Gynecology accompanied the sessions for expert support.

Research activity, consisting of surveys and offered independently of participation in the curriculum, was approved by the CWRU institutional review board, the CCJDC superintendent, and the Administrator of the Cuyahoga County Division of Children and Family Services.

Recruitment and Training

The CCJDC was chosen on the basis of its proximity to CWRU and the facility staff’s perceived deficit in its in-house health curriculum. All youths at the CCJDC were required to attend the program when it was offered as part of their in-house mandatory curriculum. However, participation in small group activities, discussions, and surveys was voluntary. To protect the identity of the participants, written consent and assent were waived in lieu of information sheets containing instructions to decline participation. There were no exclusion criteria on the basis of age, gender, or previous participation in a formal sexual health curriculum.

All student teachers were recruited from CWRU schools of medicine, nursing, and social work through peer-to-peer advertising. All student teachers underwent the same 2 training sessions for curricular content and teaching strategies, each led by a CWRU faculty member. In addition, each interprofessional teaching pair was required to meet individually for lesson-planning. Student teachers wishing to participate in the research component of the project were consented.

All expert supports were resident and attending physicians, as well as advanced nurse practitioners recruited through peer-to-peer advertising within the Department of Obstetrics and Gynecology at University Hospitals Case Medical Center.

Survey Instruments

Three surveys were administered as follows: pretest surveys of CCJDC youths’ demographic characteristics, baseline reproductive health knowledge, and previous educational experience were administered at the start of the first day, and post-test surveys were administered at the end of each lesson on the second and third days. All surveys were anonymous.

The participants’ sexual risk characteristics were measured according to the Centers for Disease Control and Prevention Youth Risk Behavior Survey. Knowledge acquisition regarding basic STI prevention and screening was measured using a 3-item pre- and post-test in true/false format. Changes in behavioral motivation were assessed using 3 validated self-efficacy scales: the Global Condom Use Self-Efficacy scale, the Contraceptive Self-Efficacy scale, and the “say no” subscale of the Sexual Self-Efficacy Scale. The latter 2 scales use a 5-item Likert scale. Modifications were made to incorporate gender-neutral pronouns (“he/she”) for use in scales used for male and female participants and to replace obsolete modes of contraception (ie, diaphragm and foam) with “condom.”

The student teachers were assessed for their level of comfort with teaching reproductive health to adolescents and for their perception of interprofessionalism.

Statistical Analyses

The differences in pre- to post-tests in reproductive health knowledge and self-efficacy scales were assessed using the McNemar test (p < 0.05). Ordinal items of the self-efficacy scales were further analyzed using Mann-Whitney tests for Median Comparisons in lieu of paired sample t tests. In the Mann-Whitney test, a significant change in median from pre- to post-test was measured. The student teachers’ data were qualitatively analyzed for uniting themes in written feedback.

Results

Study Population and Risk Assessment

Demographic and risk characteristics of the study participants are shown in Table 1. Only 28.4% (29/102) of students reported having taken a previous “sex-ed” class; however, 99.1% (105/106) of students reported having “some” or “a lot” of sex-related knowledge. The most commonly cited sources of sex-related knowledge were

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**Check one that applies to you:**

- I think I would succeed in using a condom when I have sex with a new partner
- I am not sure I could use a condom when I have sex with a new partner
- I would find it difficult to use a condom when having sex with a new partner

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**Fig. 1.** Global Condom Self-Efficacy Scale. Reproduced with full permission. 20
friends (50.9%, 54/106) and other close contacts. To a lesser extent, youths also stated they received sexual knowledge from media sources such as television or movies (35.8%, 38/106), and the internet (31.1%, 33/106).

More than 70% (74/104) of students reported sexual debut before the age of 13 years, with a mean age of 12.5 (Fig. 2). Approximately 5 youths reported never being sexually active. Among sexually active students, the mean number of lifetime partners was approximately 5, and 72.1% (75/104) of students reported 6 or more lifetime sexual partners (Fig. 2). Condom use at last intercourse was reported by only 27.9% (29/104) of youths. When asked about contraception use at last intercourse, 28.4% (29/102) reported that no method was used, approximately 22% (22/102) used condoms, and 14.7% (16/102) used birth control pills. Only 6.9% (7/102) of youths reported using long-acting reversible contraception methods with none of these being intrauterine devices or implants (Fig. 3). More than a third of youths reported a previous pregnancy (36.2% male 34/94, 18.2% female, 2/11) and approximately 20% (21/106) reported a history of STI.

Reproductive Health Knowledge Acquisition

Knowledge acquisition was measured using a 3-item pre- and post-test (Fig. 4). For the 2 items regarding STI symptoms and parent/guardian permission, 76.2% (77/101) and 72.0% (72/100) of youths, respectively, were able to choose the correct answer at the end of intervention. This translates to significant improvement in 51.2% ($P = .01$) and 55.0% ($P = .005$) of youths. Although there was no significant difference in youths who answered they should use protection regardless of regular screening, 80.0% of those

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**Table 1**

Youth Demographics and Baseline Risk Characteristics by Gender

<table>
<thead>
<tr>
<th></th>
<th>Male (n = 118)</th>
<th>Female (n = 16)</th>
<th>Total (N = 134)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Age (years)*</td>
<td>16.3 (SD = 1.7)</td>
<td>15.5 (SD = 1.3)</td>
<td>16.2 (SD = 1.4)</td>
</tr>
<tr>
<td>Prior Sex Ed class</td>
<td>Yes</td>
<td>No</td>
<td></td>
</tr>
<tr>
<td>Yes</td>
<td>28.6% (26)</td>
<td>71.4% (65)</td>
<td>28.4% (29)</td>
</tr>
<tr>
<td>No</td>
<td>72.7% (3)</td>
<td>72.7% (8)</td>
<td>71.6% (73)</td>
</tr>
<tr>
<td>Self-rated reproductive health knowledge</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>“Not much”</td>
<td>1.1% (1)</td>
<td>0</td>
<td>0.9% (1)</td>
</tr>
<tr>
<td>“Some”</td>
<td>53.7% (51)</td>
<td>45.5% (3)</td>
<td>52.8% (56)</td>
</tr>
<tr>
<td>“A lot”</td>
<td>45.3% (43)</td>
<td>54.5% (6)</td>
<td>46.2% (49)</td>
</tr>
<tr>
<td>Primary sex-related knowledge source</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Friends</td>
<td>48.4% (46)</td>
<td>72.7% (8)</td>
<td>50.9% (54)</td>
</tr>
<tr>
<td>Physicians</td>
<td>38.9% (37)</td>
<td>54.5% (6)</td>
<td>40.6% (43)</td>
</tr>
<tr>
<td>Parents/relatives</td>
<td>36.8% (35)</td>
<td>37.5% (6)</td>
<td>38.7% (41)</td>
</tr>
<tr>
<td>School</td>
<td>37.9% (36)</td>
<td>45.5% (5)</td>
<td>38.7% (41)</td>
</tr>
<tr>
<td>Television/movies</td>
<td>33.7% (32)</td>
<td>54.5% (6)</td>
<td>35.8% (38)</td>
</tr>
<tr>
<td>Internet</td>
<td>30.5% (29)</td>
<td>36.4% (4)</td>
<td>31.1% (33)</td>
</tr>
<tr>
<td>Books/magazines</td>
<td>17.9% (17)</td>
<td>27.3% (3)</td>
<td>18.9% (20)</td>
</tr>
<tr>
<td>% ever sexually active</td>
<td>98.1% (93)</td>
<td>60% (6)</td>
<td>95.2% (99)</td>
</tr>
<tr>
<td>Age at sexual debut (years)**</td>
<td>12.5</td>
<td>13.5</td>
<td>12.5</td>
</tr>
<tr>
<td>Number of partners***</td>
<td>5.4 (1.4)</td>
<td>19 (2.3)</td>
<td>5.0 (1.9)</td>
</tr>
<tr>
<td>Condom use at last intercourse</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Yes</td>
<td>28.0% (26)</td>
<td>27.3% (3)</td>
<td>27.9% (29)</td>
</tr>
<tr>
<td>No</td>
<td>69.9% (65)</td>
<td>27.3% (3)</td>
<td>65.4% (68)</td>
</tr>
<tr>
<td>Don’t know/not comfortable</td>
<td>2.2% (2)</td>
<td>45.5% (5)</td>
<td>6.7% (7)</td>
</tr>
<tr>
<td>Prior Pregnancy</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Yes</td>
<td>36.2% (34)</td>
<td>18.2% (2)</td>
<td>34.3% (36)</td>
</tr>
<tr>
<td>No</td>
<td>56.4% (53)</td>
<td>72.7% (8)</td>
<td>58.1% (61)</td>
</tr>
<tr>
<td>Don’t know/not comfortable</td>
<td>7.4% (7)</td>
<td>9.1% (1)</td>
<td>7.6% (8)</td>
</tr>
<tr>
<td>Prior STI</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Yes</td>
<td>22.1% (21)</td>
<td>0</td>
<td>19.8% (21)</td>
</tr>
<tr>
<td>No</td>
<td>74.7% (71)</td>
<td>100% (11)</td>
<td>77.4% (82)</td>
</tr>
<tr>
<td>Don’t know/not comfortable</td>
<td>3.2% (3)</td>
<td>0</td>
<td>2.8% (3)</td>
</tr>
</tbody>
</table>

Statistical comparison was possible for three categories: *p = 0.03, **p = 0.19, ***p < .001
who answered incorrectly at pretest were able to answer correctly on post-test.

**Youth Self-Efficacy**

The McNemar test for confidence in condom use with a new partner significantly increased from 71.4% (55/77) to 88.3% (53/60) from pre- to post-test \((P = .002; \text{Table 2})\). In addition, 68.2% of students who initially self-reported difficulty or uncertainty on the pre-test were able to report that they felt confident to succeed on the post-test.

Baseline confidence in controlling the immediate social circumstances surrounding contraception use as well as confidence in rejecting certain sexual pressure were between “average” and “comfortable.” There was no statistical improvement from pre- to post-test (data not shown).

**Student Teachers**

Qualitative surveys were collected from 29 student teachers at the end of the program. Four theme categories emerged: perception of youth, perception of self in teaching youth, perception of interacting with youth, and perception of working in teams. First, the student teachers remarked on the youths’ enthusiasm about learning and self-perceived changes in their own notions about this population. Two medical students wrote, “The thing I was most surprised about was how these kids just seemed like typical teenage boys... they are so gentle and vulnerable, I can see that self-esteem lies at the core of many of their personalities—it was surprising to me to see how much they loved compliments and attention.” They also reported baseline knowledge of youths to be variable, often riddled with myths; yet, “The participants were active learners, even when positive verbal reinforcement was the only reward.” Second, student teachers reported initial lack of self-confidence in teaching, struggles to be assertive, and realization about the reciprocal learning process. One student teacher noted “I didn’t have any idea how to be firm without discouraging people from participating,” but others reported that “The more engaged and respectful group members helped us with behavior regulation.” A nursing student noted that “[The youths] taught me a lot about their realities of everyday life and how their behavior is almost always a product of their environments.”

Although many teachers reported that having younger teachers was well received among youth, it might have also contributed to difficulty with controlling disruptive behavior. A complementary piece was that “Having an approachable professional [there] was also well received, especially for tougher questions.” Finally, student teachers generally perceived interprofessionalism to be a positive aspect of the program. A medical student realized that “Some topics, like resource listing, were harder to deliver due to our lack of familiarity [...] I learned that social workers have a ton of valuable information and can be a great resource for people.” Similarly, medical and nursing students particularly reported the addition of social work to the program to be invaluable. A student teacher remarked, “[My partner] and I complemented each other very well. I have learned so much about dealing with people and teens from her.”

**Discussion**

Our demographic characteristic and risk behavior data were consistent with previously published work showing a higher incidence of high-risk sexual behavior among incarcerated youth. Of all youths in our study, 49.0% (51/104) reported sexual debut by age 12 years, approximately 5 years earlier than the national average.23 Compared with national estimates of sexual behavior among teens,24,25 the youths in our study reported approximately 5.4 times more partners and 15 times the rate of previous pregnancy. At 19.8% (21/106), the rate of STIs in our youths was even higher than those published previously for other juveniles in detention (age match 16.2 vs 15.3 and 15.4 years).43 Moreover, 65.4% (68/104) of our participants reported not using a condom at last intercourse and none reported the use of intrauterine devices and implants, which are first-line contraceptive recommendations for sexually active adolescents.26 Although reproductive health education is mandatory in the state of Ohio, our data are likely reflective of significant deficits in baseline reproductive health education, access, and health literacy in our study population, because more than 70% (73/102) of participants reported having never taken a previous “sex ed” class.

Our effort resulted in a significant improvement in several key topics, including knowledge about STI screening, parental consent for STI treatment, safe sex practices, and condom self-efficacy. More than 50% of participants showed significant improvement in each of the 3
quiz items at postintervention. Because known barriers to access for adolescents include concerns about confidentiality and discomfort with health care facilities, the significant increase in awareness of the fact that minors do not require parent/guardian consent might lead to increased access to STI services. We also predict that exposure to future and current health care professionals in an informal setting might mitigate the discomfort in seeking care. Of those who were previously uncomfortable with condom use with a new partner, 68.2% were able to report confidence at the end of the program. In all, our novel low-cost intervention significantly improved practical knowledge about STI screening as well as self-efficacy for condom use in this high-risk youth population. Although participants did not show significant improvement in situational contraception use and sexual autonomy self-efficacy, we recognize that both of these require a synthesis of health literacy, communication, and decision-making skills that inform autonomous social behavior, and are also strongly influenced by societal norms and biases. It is possible that the short duration of the program might have been insufficient to significantly improve these marginalized youths’ baseline lack of communication skill and assertiveness.27,28

An important component of our program was the integration of interprofessional students into teams as a way of providing them with opportunities for practice-based learning. As the complexity of health care delivery continues to increase, interprofessional education is becoming a cornerstone of safe and effective care.27,28 Our qualitative data suggest that programs such as ours might naturally promote interprofessional teamwork by providing a hands-on framework. Moreover, our program promotes familiarization with counseling surrounding reproductive health topics while it provides a unique opportunity to access this vulnerable adolescent population. Our qualitative data support that reproductive health programs such as ours might assist in training more self-efficacious and empathetic practitioners and team members.

Strengths of this study include the practical applicability of our findings and the use of validated self-efficacy scales, such as the global condom self-efficacy scale, which has been shown to be predictive of intended as well as actual condom use among teens.20 Our model also has a low-resource requirement and reciprocally benefits the student teachers who seek exposure to at-risk adolescent counseling. It is also possible that the relatively close age difference between the youth and student teachers might have helped modify peer norms with respect to safer sexual behavior, which is a known behavioral predictor in this population.17,18 Finally, we created an educational setting in which the benefits and necessity of interprofessional collaboration was readily perceived by the student teachers.

Our study has several important limitations. First, we were not able to conduct follow-up studies of our participants after release on ethical grounds. Hence, it is unclear whether our program resulted in long-term knowledge retention and behavioral change. Next, an inherent limitation of self-reported surveys is social desirability bias, which might have been particularly applicable because of the sensitive nature of our topics. This limitation might have disproportionately affected the pretest relative to the posttest as the youths developed more trust with the student teachers.

In all, our interprofessional student-led reproductive health program delivered a much-needed comprehensive education to juveniles in detention with evidence of improvement in reproductive health literacy and condom use confidence. The particular strengths of our model include the low-resource requirement, reciprocal benefits for the student teachers seeking exposure to at-risk adolescent counseling, and potential peer norm-changing effect of younger teachers. A comprehensive reproductive health education offered by an interprofessional team of student teachers to youths in detention might represent a mutually beneficial partnership that can directly influence at-risk adolescent sexual health literacy.

Acknowledgment

We are in awe of the many caring individuals who readily gave their time, expertise, and resources to support our project. First, we thank Drs Susan Wentz, Elizabeth Madi- gan, and Karen Ashby for their ongoing guidance. We thank Ms Jesse Honsky for her help with structuring our curricu-lum as well as Dr Ronald Hickman for training and database design. Nikki Zalenski, Drs Colleen Croniger and Amy Wilson-Delfosse have been excellent consultants. We are grateful to Ms Jacqueline Brackett and others at the CCJDC for our partnership. The CWRU institutional review board has been very open and helpful in protecting our vulnerable population. We thank our parent organization, the Student Run Free Clinic, as well as Emily Kao, Theresa Fisher, and Christina Pindar, who will help continue this project. Our students at the CCJDC were fantastic participants and taught us much in return. Finally, we thank our student teachers for their enthusiasm and compassion, without which our project would not have been possible.

References


