**Tentative Title:**

*“Exploring Relationships between Emergency Contraceptives, Dating Apps and Risky Sexual Behaviors among College Students”*

**Target Submission Date: FALL 2022**

**Dissemination target(s):**

* Suggested Conference podium presentations:
  + SNRS 2023 Annual Conference Orlando, FL
    - Dates Mar 1-3, 2023
  + AANP  2023 Annual Conference New Orleans, LA
    - Dates: June 20-25, 2023
  + ASTDA 2023 STI and HIV World Congress in Chicago, IL
    - Dates: July 24-27, 2023

**Journal article (name):** Journal of American College Health (JACH)

Requirements: Structured abstract of 150 words. Objective, Participants, Methods, Results, and Conclusions.

The preferred length is 15 to 20 double-spaced pages (no more than 20 pages) (4,000–6,000 words), not including tables, figures, and references.

o Other (please specify):

* Health Education Journal
* Sexual Transmitted Diseases

**Purpose:** The purpose of this project is to identify risk factors that negatively impact risky sexual

behaviors among college students.

**Research Question(s):**

1. Does the use of emergency contraceptives negatively impact condom use among college students?
2. Does the use of dating apps increase the number of sexual partners among college students?

**Tentative Title:** *“Exploring Relationships between Emergency Oral Contraceptives (EOC), Dating Apps and Risky Sexual Behaviors among College Students”*

**Abstract (150 words):**

**Objective:** Explore the use of EOC and dating apps and their effect on risky sexual behaviors among college students.

**Participants:** Surveyed 122 sexually experienced college students aged 18–35.

**Methods:** Multiple logistics regressions were used to explore the association among variables.

**Results:** Over half (55.7%) of the participants met one or more sexual partner(s) using a dating app. Of the 122 participants, 38 (31%) reported never having STI or HIV testing, 21 (17%) reported having a previous STI, and 14 (11%) stated that they were HIV positive. The majority of participants reported inconsistent condom use or never using a condom. Contrary to our hypothesis, there was no association between access to EOC and risky sexual behaviors (condomless sex).

**Conclusions:** The use of dating apps is a risk factor for risky sexual behavior. We recommend universities offer “sex-positive” STI/HIV prevention workshops with effective strategies that will improve safer sex practices among college students.

**Outline**

* **Paragraph 1: Introduction of RSB (risky sexual behaviors) (JR)**

Sexually transmitted infections (STIs) and HIV infections are results of risky sexual behaviors that remain a significant global and public health problem in the U.S.1,2. Per the Centers for Disease Control and Prevention (CDC), from 2015 through 2019, HIV diagnoses increased among persons aged 13 to 24 years old1, and approximately 51 percent of youth living with HIV are unaware that they are infected7,8. It is more alarming to know that surveillance systems have recently found that more than 1 in 5 new HIV diagnoses were among youth between the age of 13 to 24 years old6. Risky sexual behaviors can lead to adverse outcomes due to the occurrence of STIs, HIV, and unplanned pregnancies9,10. These infections can be easily passed from one person to another through oral, vaginal, or anal sexual intercourse. Some STIs can be asymptomatic (e.g., chlamydia, gonorrhea) and, if untreated, could cause significant long-term health consequences such as infertility, ectopic pregnancy, sterility, and cancer of the vagina, penis, anus, or throat, and severe pelvic pain5,9. Due to confidentiality concerns, costs, embarrassment, shame, and other social factors, many adolescents and young adults don’t seek STI and HIV testing with their primary care providers17. Thus, the CDC national survey showed that STI and HIV testing guidelines among youth aged 15–25 are not regularly followed, and STI testing is suboptimal17,18. Consequently, those who are infected with an STI or HIV end up spreading the infection to their partners without even knowing it4. In 2019, the number of new HIV diagnoses was highest among people aged 25 to 29 CDC1,4,8. By region, the highest rates of new diagnoses continue to occur in the South. This study aims to identify factors that potentially have a negative effect on risky sexual behaviors among young adults living in the Northern Texas area.

Risky sexual behaviors (RSB) involve any sexual activity that places someone at risk for an STI or HIV infection. RSB are defined as: (1) having oral, vaginal, or anal sex without a condom (male, female or dental dam) or inconsistent condom use9,10, (2) having multiple sex partners or a high-risk partner (one who has multiple sex partners or other risk factors, i.e., I.V. drug use)9,10, (3) early sexual debut, particularly before 18 years of age10,11, and (5) changing sexual partners frequently10,12. Young adults who are sexually active should get tested at least once for HIV3. However, depending on their risky sexual behaviors, individuals who are at a higher risk of acquiring HIV should be tested annually3. The CDC recommends that all sexually active young adult women under the age of 25 should be tested yearly for gonorrhea and chlamydia3. However, young adults face multiple barriers to accessing proper sexual health and STI preventative services, including but not limited to a lack of funds, uninsured, fear of billing parents insurance, and transportation13,14. In addition, most young adults do not receive many of the recommended sexual health care services, including STI and HIV screenings or counseling services15,16.

* **Paragraph 2: Negative influence on RSB – (JR)**
  + **The role of emergency contraception (the morning-after pill)**
* Emergency oral contraceptive (levonorgestrel hormone) known as the “morning-after pill” or “Plan B,” is used within 24 hours after having unprotected sex to reduce the probability of pregnancy22. Though the medication is available to purchase without a prescription, this type of medication treatment should not be used as a routine method for birth control and offers no protection against STIs or HIV. A study conducted in the UK found a link between the use of emergency oral contraceptives (EOC) and an increase in STIs among teenage girls19. Another study found that college students’ belief in the effectiveness of EOC negatively affects the use of condoms20. The CDC National Center for Health Statistics (2013) reported in a study among women aged 15–44 (N=12,279) that 59% had used an EOC once or twice. The main two reasons reported for the use of EOC by participants were: 1) fear of condom method failure (45%), and 2) they had unprotected sex (49%)21. We are currently facing a growing epidemic of STIs and HIV among young adults1,2, and the use of EOC has significantly increased over the past decade among young women21. However, there is a dearth of research studies examining the association between the use of EOC and risky sexual behaviors (e.g., condomless sex).

* **Paragraph 3: Dating app users and condom use behavior – need 2 authors** (JR) ( )
  + **dating apps negative impact on RSB**.

Geosocial networking applications also called “dating apps,” have been around for over 20 years. The popularity of online dating apps has significantly increased among young adults24,26,27 and regrettably is often used for “sex on-demand23,26,28. Several studies have shown the use of d**ating a**pps is making it easier to find a partner for casual sex or “hooking up”24,25,26. Therefore, it isn’t surprising to see an increase in STIs and HIV infections among individuals aged 15 to 24 years, among both sexes1,5,7. However, there’s little data to show that dating app usage equates to more acquisition of STIs and HIV infection among young adult populations.

* **Paragraph 4: Barriers to screening and testing?** ( ) ( )
  + How screening can decrease STI/HIV rates
  + Barriers to screening for college students: privacy, inconvenience, and cost
  + Decrease access to healthcare providers

**Materials and Methods**

1. Materials and Methods (JR)

The University of Texas at Arlington Institutional Review Board approved this study. A waiver of documentation of informed consent was granted by the Institutional Review Board, and the consent was included in the online survey through QuestionPro. The online survey link was sent to UTA students’ school email (both undergraduate and graduate level) enrolled at the University of Texas at Arlington during the Fall 2021 semester (August–December 2021). Distribution of the survey link was sent from the Department of Communications to invite students to participate in a web-based survey through QuestionPro, and flyers were posted throughout the campus with a QR code connected to the survey link. The survey system was programmed to allow one response per person, preventing students from taking the survey multiple times. At the end of the survey, participants had the option to go to a separate webpage and enter their email address to be included in a raffle drawing for 1 of 6 $50 Amazon electronic gift cards. If they chose to be entered into the drawing, they were to click on a link to a separate page and enter their name and UTA email address. Their name and email did not connect to their survey responses. The information was used to notify the winner of the electronic gift cards. We analyzed data from 122 college students who completed the survey within the Fall semester term (response rate = 28.6%).

The survey instrument included questions about the respondents’ sexual behaviors, knowledge of STIs, HIV, and beliefs regarding condom use and emergency contraceptives. It was estimated to take 10-15 minutes to complete. Demographic information about age was asked to all respondents before the first question. The survey was set to terminate immediately if the participant is under the age of 18 years old. Next, respondents were asked to complete 29 multiple-choice and three fill-in-the-blank questions. The survey started with questions to ascertain demographic information about the study population (e.g., age, gender, race, marital status, undergraduate/graduate status).

There were a series of multiple-choice questions that asked respondents about their sexual history, use of condoms during sexual activities, and use of emergency contraceptives. Ten questions from the Attitudes Towards Condom Use scale were used to assess the respondents’ beliefs about condom use. The survey included questions regarding STI and HIV exposure, testing and treatment, and knowledge of sexual health services available on campus. The survey concluded with three fill-in-the-blank questions asking respondents about sexual partners from dating apps and their thoughts on receiving free STI/HIV testing. All individual responses were anonymous, and no personal identifying information was collected.

**Inclusion/Exclusion**

Participants who were 18 years or older, enrolled as students at The University of Texas at Arlington, and able to read the English language were included in the study. Ineligible participants excluded from this study were participants under 18 years old.

**Methods** (for Statistician)

Frequencies were calculated for all items, and comparisons were made between male and female respondents. IBM SPSS Statistics for Windows, Version 27.0. (IBM Corp. Released 2020, Armonk, NY) was used for all analyses.

Measures (JR) (stats)

Data analysis (stats)

**Results** (stats)

**Discussion**

1. **Summary/Overview of findings ( )**
2. Key point 1: Importance of increasing public knowledge regarding the negative factors of dating apps and EOC influencing risky sexual behaviors ( )
3. **The role of college**
4. Key Point 2: There is a vital role for universities to offer “sex-positive” workshops on college campuses. This would include having comprehensive, wrap-around services, supplemental STI/HIV education, and curricula that are inclusive of delivering free testing and treatment while fostering a safe environment for students. In addition, faculty support and administrative policy adaptations are essential to successfully implementing “sex-positive” workshops on campus. There’s a need for student health centers to serve as the direct provider of clinical services for students seeking STI/HIV testing and treatment. Introducing a positive sex environment on college campuses would help to reduce the stigma and shame associated with young adults seeking sexual and reproductive health services. (JR)

**The role of community health**

1. Key Point 3: Public health and community healthcare providers can work together on strategies that can be used to increase access, screening/testing, and treatment (confidentially) on college campuses ( )

**Limitations (JR)**

There are a few limiting factors to consider in interpreting our findings. First, all outcomes were self-reported, which might have recall bias. Second, the cross-sectional design of this study could not show causality. Third, a small proportion of participants compared to the total number of enrolled college students. Therefore, the findings of this pilot study may not be generalizable to broader populations.

**Conclusion** ( )

Recommend that universities should offer workshops with “sex-positive” strategies that will improve safer sex practices, and promote sexual responsibility (e.g., condom use, STI, and HIV testing) among college students.

**Reporting Chi Squared Tests**

Reporting Chi-Square Results (APA) Good website: <https://www.socscistatistics.com/tutorials/chisquare/default.aspx>

A chi-square test of independence was performed to examine the relation between Condom Use and Total Number of Sexual Partners Met Through an App. As shown in Figure 1 only two survey recipients had 2 or more sexual partners they met through the app, so we condensed the results to simply compare those who had a met a sexual partner through apps and those that had not. The relation between these variables was not significant, χ2(1, N = 101) = 0, p = 1. Condom use and number of sexual partners met through the app are independent.

A chi-square test of independence was performed to examine the relation between Condom Use and Total Number of Sexual Partners. Figure 2 shows that the number of partners varies with no specific group dominating, so we run the chi squared test against all values of sexual partners. The relation between these variables was significant, χ2(6, N = 120) = 13.36, p = .04. People with fewer total sex partners are more likely to use condoms than those with more sexual partners. This is interesting because the number of sexual partners drives condom use more than if sexual partners are met through an app or not.

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| Question | Chi Squared Value | 95% Critical Value / DoF | P value | Accept or Reject Independence | Correlation |
| CU vs. App | 1.1301 | 9.35, df = 3 | 0.7698 | Dependent | Positive |
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